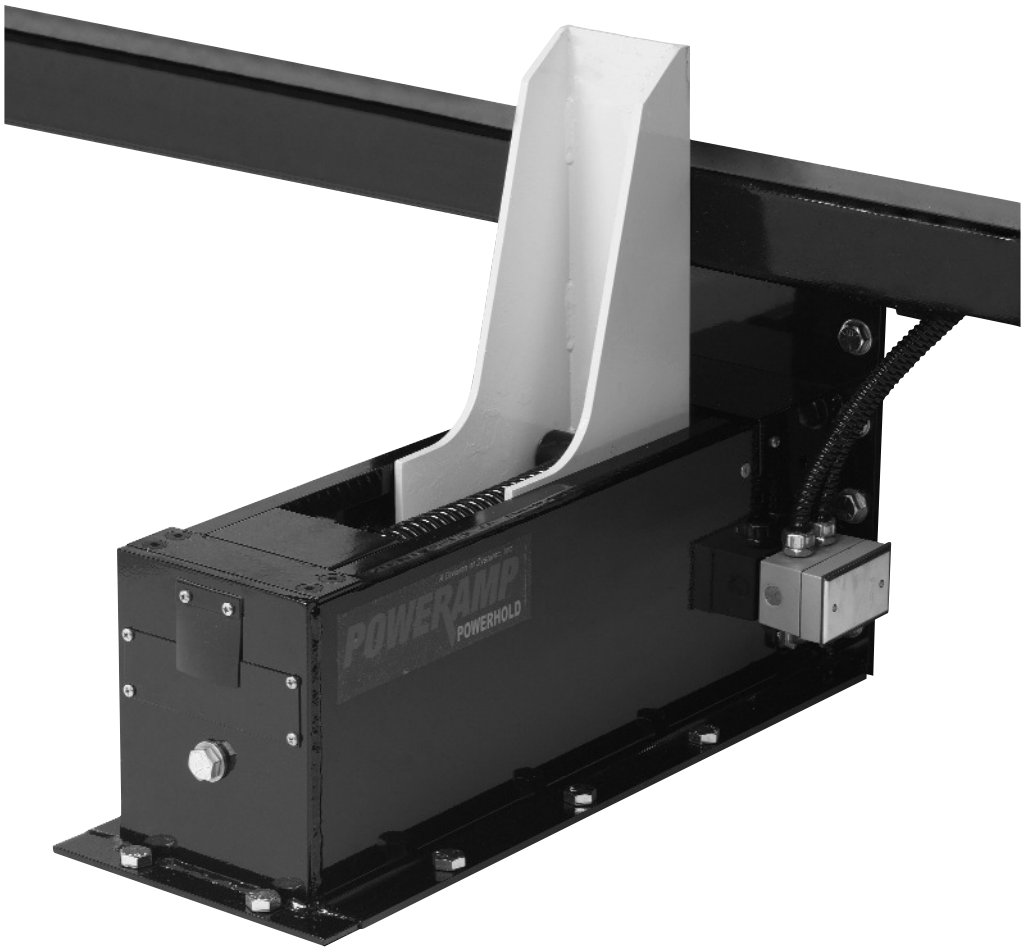
POWERAMP
McGUIRE
DLM
SYSTEMS, INC.
Loading Dock Equipment

PowerHold®

Truck Restraint

OWNER'S / USER'S MANUAL

POWERHOLD & POWERHOLD SC



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Recognize Safety Information

Safety-Alert Symbol

The Safety-Alert Symbol identifies important safety messages on equipment, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

DANGER

The use of the word DANGER signifies the presence of an extreme hazard or unsafe practice which will most likely result in severe injury or death.

WARNING

The use of the word WARNING signifies the presence of a serious hazard or unsafe practice which may result in serious injury or death.

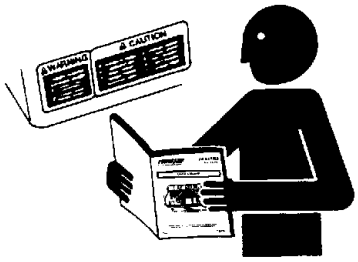
CAUTION

The use of the word CAUTION signifies possible hazard or unsafe practice which could result in personal injury.

IMPORTANT

The use of the word IMPORTANT is to draw attention to a procedure that needs to be followed to prevent machine damage.

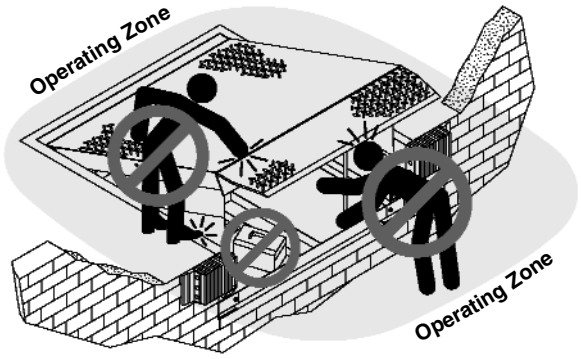
General Operational Safety Precautions



Read and understand the operating instructions and become thoroughly familiar with the equipment and its controls before operating the dock leveler.

Never operate a dock leveler while a safety device or guard is removed or disconnected.

Never remove DANGER, WARNING, or CAUTION signs or Decal's on the equipment unless replacing them.



Do not start the equipment until all unauthorized personnel in the area have been warned and have moved outside the operating zone.

Remove any tools or foreign objects from the operating zone before starting.

Keep the operating zone free of obstacles that could cause a person to trip or fall.

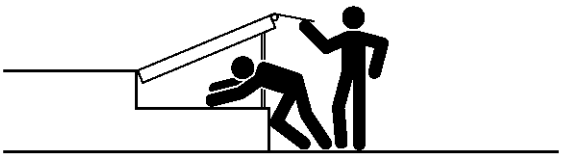
SAFETY

Operational Safety Precautions

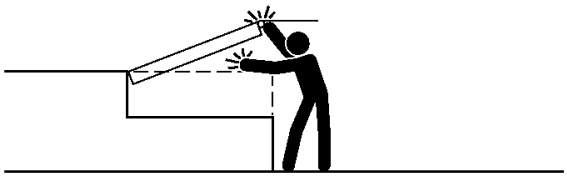
Learn the safe way to operate this equipment. Read and understand the manufacturer's instructions. If you have any questions, ask your supervisor.

DANGER

Stay clear of dock leveling device when freight carrier is entering or leaving area.

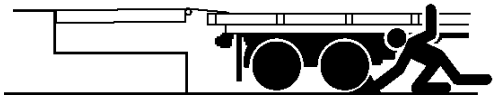


Do not move or use the dock leveling device if anyone is under or in front of it.

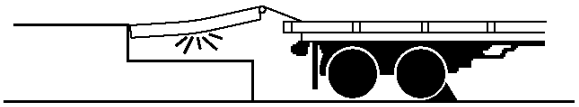


Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.

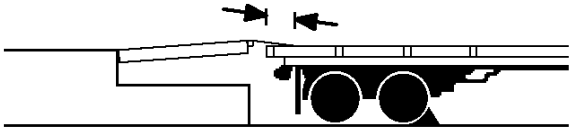
WARNING



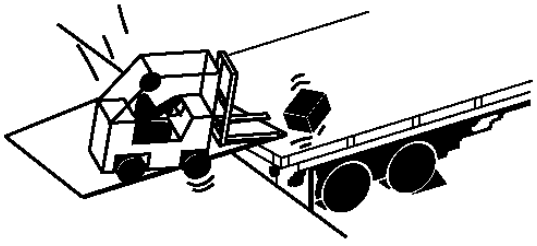
Chock/restrain all freight carriers. Never remove the wheel chocks until loading or unloading is finished and truck driver has been given permission to drive away.



Do not use a broken or damage dock leveling device. Make sure proper service and maintenance procedures have been performed before using.

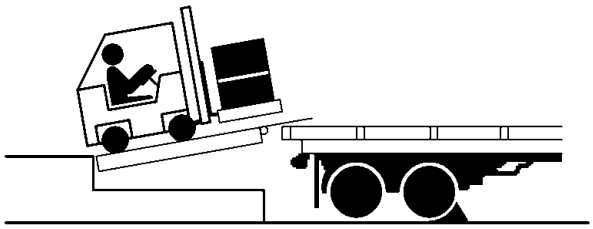


Make sure lip overlaps onto trailer at least 4 in. (102 mm).

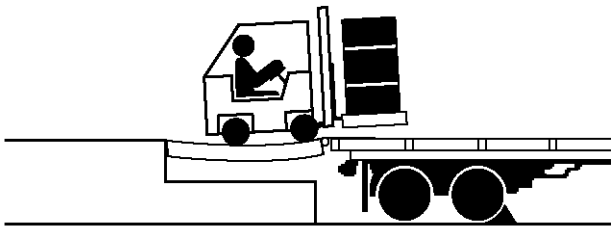


Keep a safe distance from both side edges.

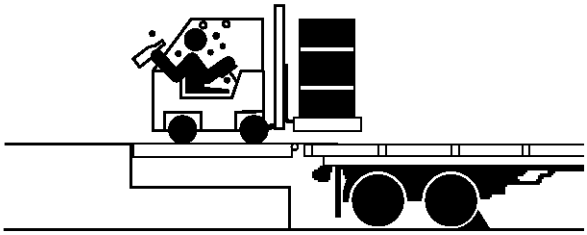
⚠ WARNING



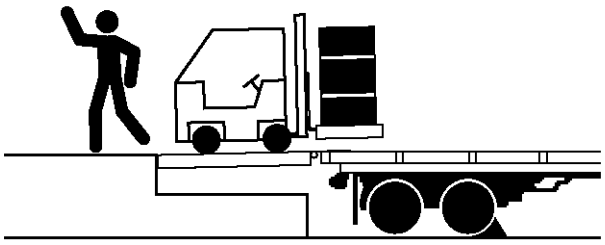
Do not use dock leveling device if freight carrier is too high or too low.



Do not overload the dock leveling device.



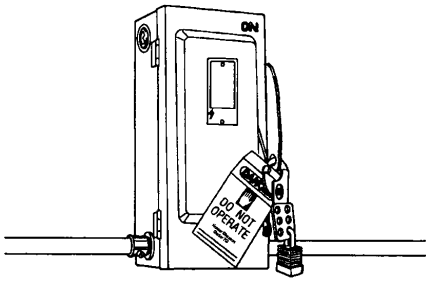
Do not operate any equipment while under the influence of alcohol or drugs.



Do not leave equipment or material unattended on dock leveling device.

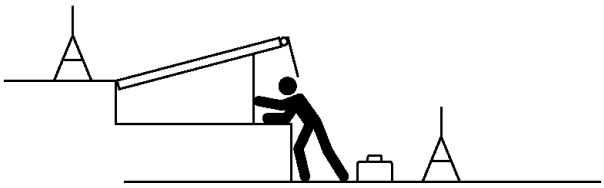
Maintenance Safety Precautions

DANGER

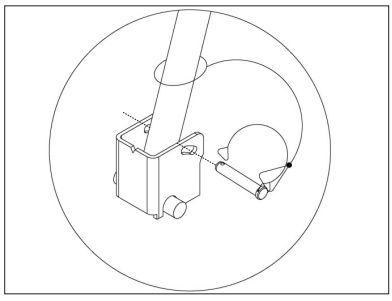


Hydraulic and electrical power must be OFF when servicing the equipment. For maximum protection, use an OSHA approved locking device to lock out all power sources. Only the person servicing the equipment should have the key to unlock the device.

CAUTION



Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the unit before maintenance is complete.



The maintenance prop must be in the upright "service" position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the device.

WARNING

ALWAYS disconnect electrical power source and ground wire before welding on dock leveler.

DO NOT ground welding equipment to any hydraulic or electrical components of the dock leveler. Always ground to the dock leveler frame.

Failure to follow these instructions may result in damage to dock leveler and/or serious personal injury or death.

WARNING

DO NOT grind or weld if hydraulic fluid or other flammable liquid is present on the surface to be ground or welded

DO NOT grind or weld if uncontained hydraulic fluid or other flammable liquid is present. Stray sparks can ignite spills or leaks near the work area. Always clean up the oil leaks and spills before proceeding with grinding or welding.

Always keep a fire extinguisher of the proper type nearby when grinding or welding.

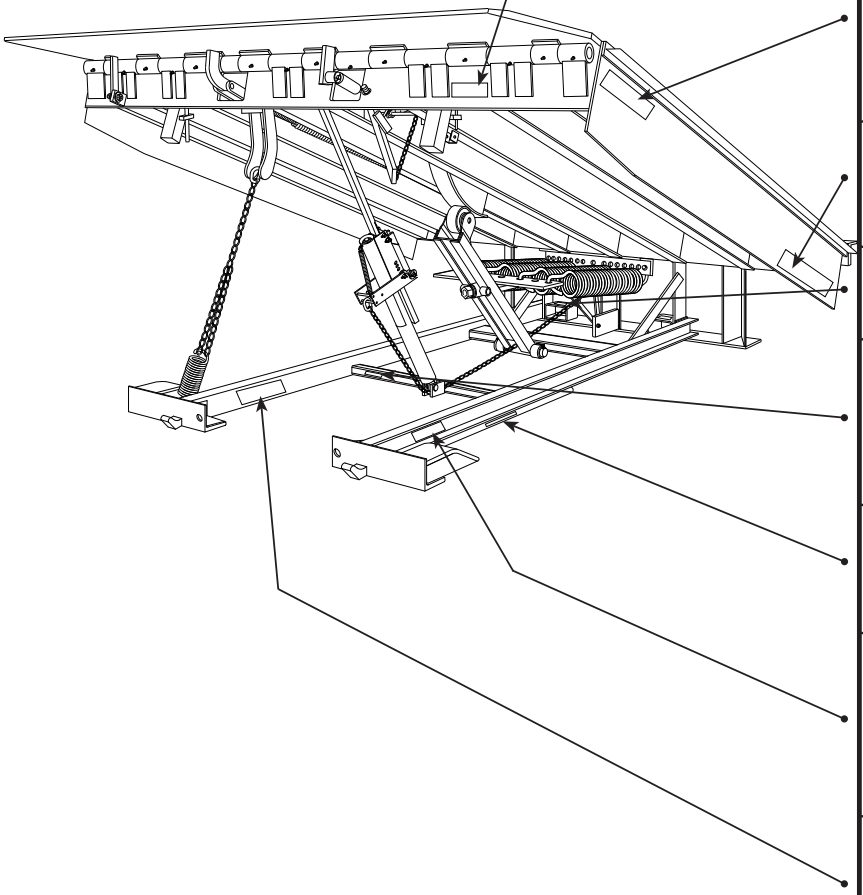
Failure to follow these instructions may result in serious personal injury or death.

WARNING

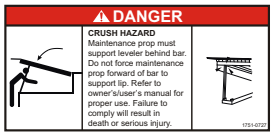
ALWAYS stand clear of dock leveler lip when working in front of the dock leveler. Failure to do this may result in serious personal injury or death.

Dock Leveler Safety Decal's

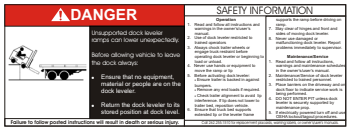
Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and are easily legible. If any are missing or require replacement, please call 1-800-643-5424 for replacements.



1751-0727


DANGER
CRUSH HAZARD
Maintenance prop must support leveler behind bar. Do not force maintenance prop forward of bar to support lip. Refer to owner's/user's manual for proper use. Failure to comply will result in death or serious injury.
1751-0727

1751-0730 (x2)


DANGER
Unsupported dock leveler ramps can lower unexpectedly.
Before allowing vehicle to leave the dock always:
Ensure that no equipment, material or people are on the dock leveler.
Return the dock leveler to its stored position at dock level.
Failure to follow posted instructions will result in death or serious injury.
SAFETY INFORMATION

(decal placed in same position on both sides)

1751-0329 (x2)

(decal placed in same position on both sides)

1751-0330 (x2)

(decal placed in same position on both sides)

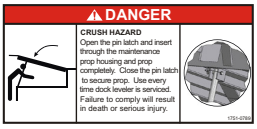
1751-0728

DANGER
CRUSH HAZARD
Do not remove main springs until leveler is safely supported by maintenance prop. Main springs contain stored energy. Be sure springs are fully unloaded and ends are loose before removal. Refer to owner's/user's manual for proper maintenance procedure. Failure to comply will result in death or serious injury.

1751-0788

DANGER
CRUSH HAZARD
Do not work under dock leveler unless this maintenance prop has been secured in the upright position. See owner's/user's manual for proper procedures. Failure to comply will result in death or serious injury.

1751-0789

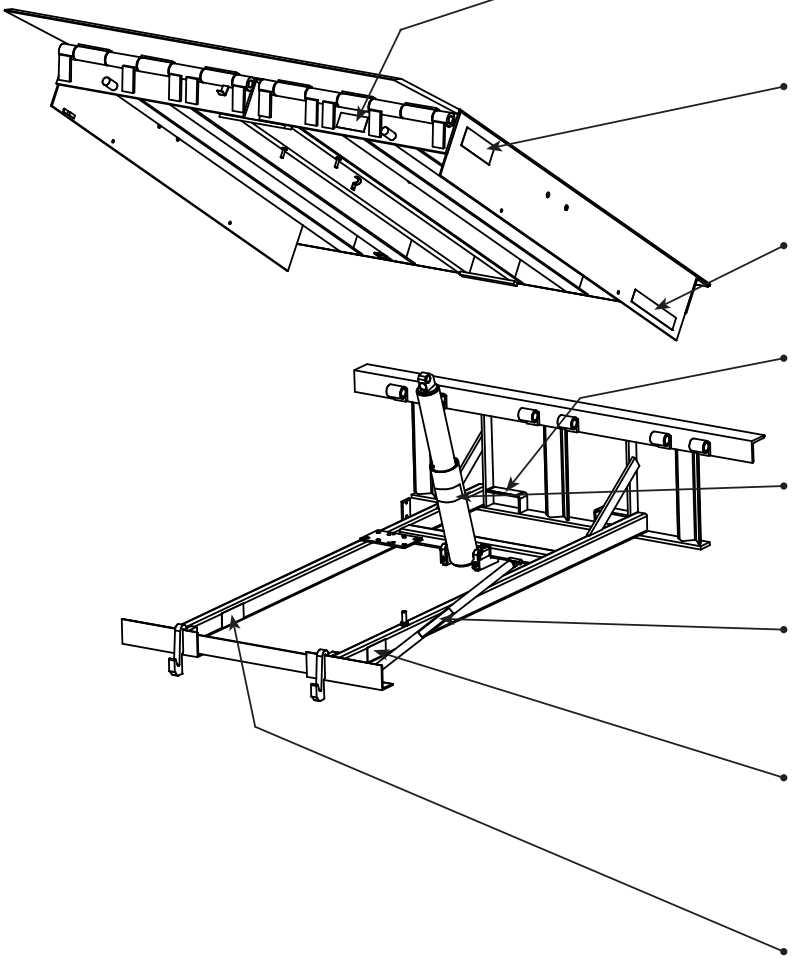

DANGER
CRUSH HAZARD
Open the pin latch and insert through the maintenance prop housing and prop completely. Close the pin latch to secure prop. Use every time dock leveler is serviced. Failure to comply will result in death or serious injury.

1751-0726

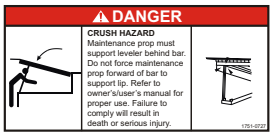
DANGER
CRUSH HAZARD
DO NOT ENTER PIT unless dock leveler is safely supported by maintenance prop. Place barriers on driveway and dock floor to indicate service work being performed. Refer to owner's/user's manual for proper maintenance procedures. Failure to comply will result in death or serious injury.

SAFETY Decal's

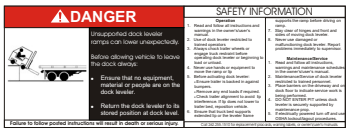
Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and are easily legible. If any are missing or require replacement, please call 1-800-643-5424 for replacements.



1751-0727


DANGER
CRUSH HAZARD
Maintenance prop must support leveler behind bar. Do not force maintenance prop forward of bar to support lip. Refer to owner's/user's manual for proper use. Failure to comply will result in death or serious injury.

1751-0730 (x2)



(decal placed in same position on both sides)

1751-0329 (x2)

(decal placed in same position on both sides)

1751-0330 (x2)

(decal placed in same position on both sides)

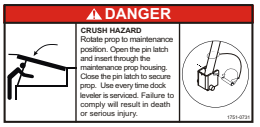
1751-0138

DANGER
CRUSH HAZARD
DO NOT REMOVE hydraulic cylinder until leveler is safely supported by maintenance prop. Refer to owner's/user's manual for proper maintenance procedure. Failure to comply will result in death or serious injury.

1751-0729

DANGER
CRUSH HAZARD
Do not work under dock leveler unless this maintenance prop has been secured in the upright position. See owner's/user's manual for proper procedures. Failure to comply will result in death or serious injury.

1751-0731


DANGER
CRUSH HAZARD
Rotate prop to maintenance position. Open the pin latch and insert through the maintenance prop housing. Close the pin latch to secure prop. Use every time dock leveler is serviced. Failure to comply will result in death or serious injury.

1751-0726

DANGER
CRUSH HAZARD
DO NOT ENTER PIT unless dock leveler is safely supported by maintenance prop. Place barriers on driveway and dock floor to indicate service work being performed. Refer to owner's/user's manual for proper maintenance procedures. Failure to comply will result in death or serious injury.

OWNER'S/USER'S RESPONSIBILITIES

1. The owner/ user should recognize the inherent dangers of the interface between the loading dock and the transportation vehicle. The owner/ user should, therefore, train and instruct all operators in the safe operation and use of the loading dock equipment in accordance with manufacturer's recommendations and industry standards. Before operation of the equipment, all operators shall read, understand and be familiar with all functions of equipment as described in the owner's/user's manual.

2. The manufacturer shall provide to the initial purchaser all necessary information with regards to: Safety Information, Operation, Installation and Safety Precautions, Recommended Initial and Periodic Inspections Procedures, Planned Maintenance Schedule, Product Specifications, Troubleshooting Guide, Parts Break Down, Warranty Information and Manufacturers Contact Information. The owner/ user shall be responsible to verify that this information is available and received as well as proper instructions, training and familiarity of the equipment for all operators has been completed. Owner's/ User's shall actively maintain, update and re train all operators on safe working habits and operations of the equipment.

3. It is recommended when the transportation vehicle is positioned correctly in the dock opening and in contact with both bumpers, there shall be a minimum of 4.00 inches (100mm) overlap of the leveling device and the transportation vehicle at all times during the loading and unloading process.

4. Name plates, placards, Decal's, instructions and posted warnings shall not be obscured from the view of the operator or maintenance personnel for whom such warnings are intended for. Contact manufacturer for any replacements.

5. Manufacturer's recommended periodic maintenance and inspection procedures in effect at the date of shipment shall be followed at all times. Written documentation of maintenance, replacement parts or damage should be retained. In the event of damage notification to the manufacturer is requested.

6. Any modifications or alterations of loading dock equipment shall only be done with prior written approval from the original equipment manufacturer.

7. When industrial moving devices are being used in the loading or unloading of product from the transportation vehicle, this vehicle shall have the brakes and wheel chocks applied appropriately or all other positive restraining device shall be fully utilized.

8. Loading dock safety equipment should never be used outside of its intended use, range, or capacity. Please consult the manufacturer if you have any questions as to the use, range or capacity of the equipment.

9. When selecting loading dock safety equipment, it is important to consider not only present requirements but also future plans and any possible adverse conditions, environments or use.

INTRODUCTION

Congratulations on your choice of a Poweramp PowerHold truck restraint. This manual covers the PowerHold Truck restraint operating system.

Designed by Poweramp to be a marvel of simplicity and efficiency, your truck restraint, when properly installed, will provide many years of trouble-free performance with an absolute minimum of maintenance. Its revolutionary hydraulic system efficiently controls and operates every function. To obtain maximum performance and longest possible use, a simple program of preventive maintenance is recommended and is outlined in this manual.

The PowerHold truck restraint is designed to seek, find and maintain a tight, continuous hold on the RIG (Rear Impact Guard) bar, effectively eliminating "trailer creep". As an optional safety feature, the dock leveler and truck restraint can be interlocked, preventing operation of the dock leveler until the hold engages the truck RIG bar.

The Truck restraint is firmly anchored to the drive way approach or the building wall for maximum holding power. The PowerHold restraint is designed to withstand a pulling force of 30,000 lbs.

The PowerHold truck restraint comes equipped with an electrical control panel, which allows push button operation of the truck restraint functions.

When combining a Poweramp Dock Leveler with a PowerHold truck restraint, the control panel will allow for operation of both units in the same control panel.

Each PowerHold, Poweramp Dock Leveler and control panel has been factory prewired and tested to ensure satisfactory operation.

To illustrate which connections are to be made in the field at installation, electrical drawings are included with each order or by contacting Poweramp Technical Services.

Once again, thank you and congratulations on your purchase of a Poweramp PowerHold truck restraint.

Due to ongoing product improvement, some parts have changed, along with operation and trouble shooting methods. For further assistance, please contact:

Poweramp Technical Service at 800-643-5424 or techservices@docksystemsinc.com

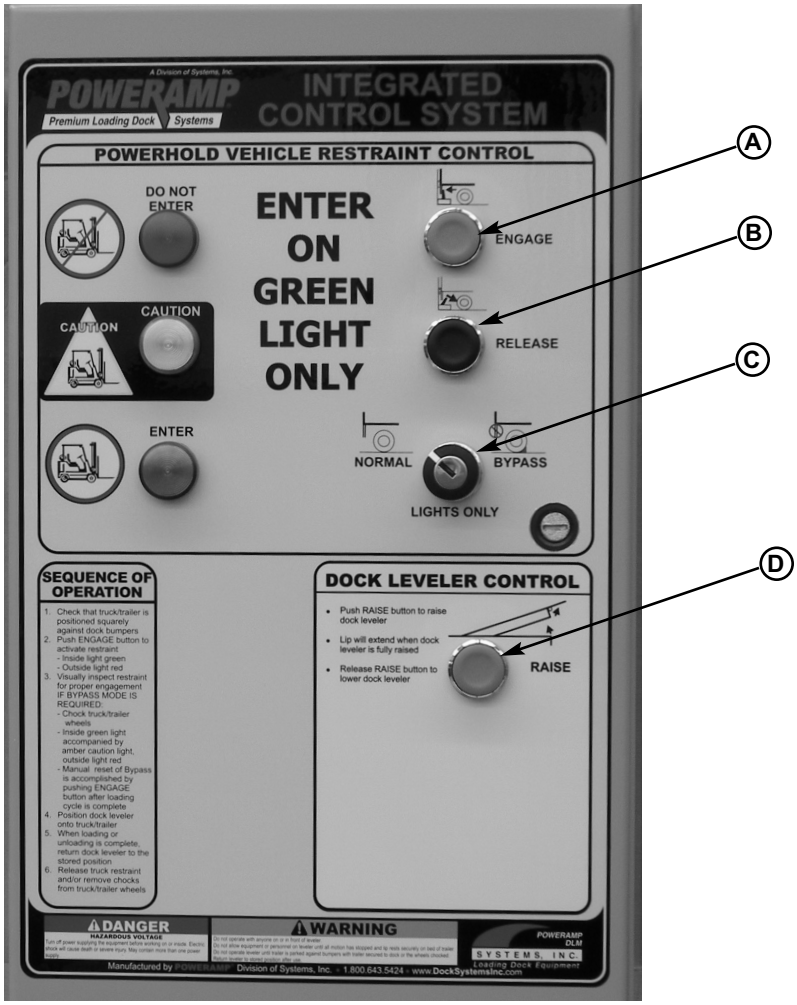
Theory

When the engage button (A) is pushed on the control panel this activates an electric motor which, drives a hydraulic pump. The hydraulic pump forces oil into the hydraulic cylinder causes the shoe to raise.

The shoe will make contact with the ICC bar. The pump will shut off one the shoe is at 90deg. Once the truck is locked The leveler the raise button will be activated(D).

When the release button (B) is pushed the motor will run and lower the shoe. After the shoe is stored the pump will run 10 seconds then will time out and the pump will turn off.

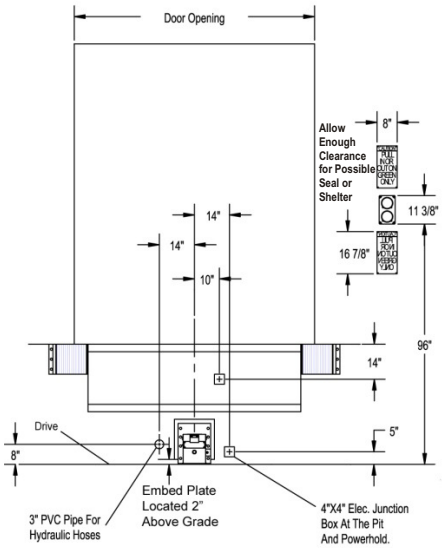
If no ICC Bar is preset Power Hold can be operated in bypass (C)z.

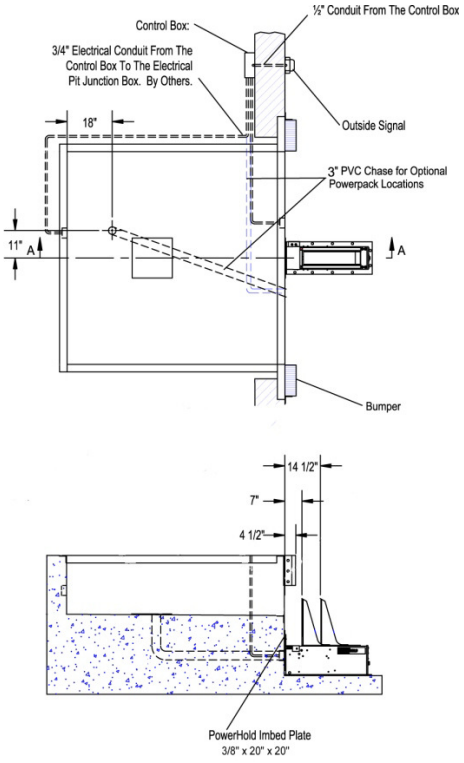

A
B
C
D
POWERAMP
Premium Loading Dock Systems
INTEGRATED CONTROL SYSTEM
POWERHOLD VEHICLE RESTRAINT CONTROL
DO NOT ENTER
ENTER ON GREEN LIGHT ONLY
ENGAGE
CAUTION
CAUTION
RELEASE
ENTER
NORMAL
BYPASS
LIGHTS ONLY
SEQUENCE OF OPERATION
1. Check that truck/trailer is positioned squarely against dock bumpers
2. Push ENGAGE button to activate restraint
- Inside light green
- Outside light red
3. Visually inspect restraint for proper engagement
IF BYPASS MODE IS REQUIRED:
- Chock truck/trailer wheels
- Inside green light accompanied by amber caution light, outside light red
- Manual reset of Bypass is accomplished by pushing ENGAGE button after loading cycle is complete
4. Position dock leveler onto truck/trailer
5. When loading or unloading is complete, return dock leveler to the stored position
6. Release truck restraint and/or remove chocks from truck/trailer wheels
DOCK LEVELER CONTROL
Push RAISE button to raise dock leveler
Lip will extend when dock leveler is fully raised
Release RAISE button to lower dock leveler
RAISE
DANGER
HAZARDOUS VOLTAGE
WARNING
POWERAMP DLM SYSTEMS, INC.
Loading Dock Equipment
Manufactured by POWERAMP Division of Systems, Inc. • 1.800.643.5424 • www.DockSystemsInc.com

A Division of Systems, Inc.
POWERAMP
Premium Loading Dock Systems

PowerHold Installation Overview

For comprehensive installation instructions of the PowerHold read and understand the Installation and Operation Manual.

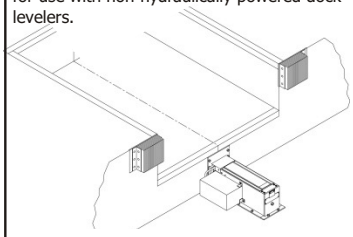




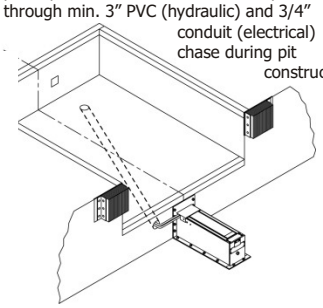
POWERPACK LOCATION OPTIONS

Coordinate powerpack location and hose length for proper placement.

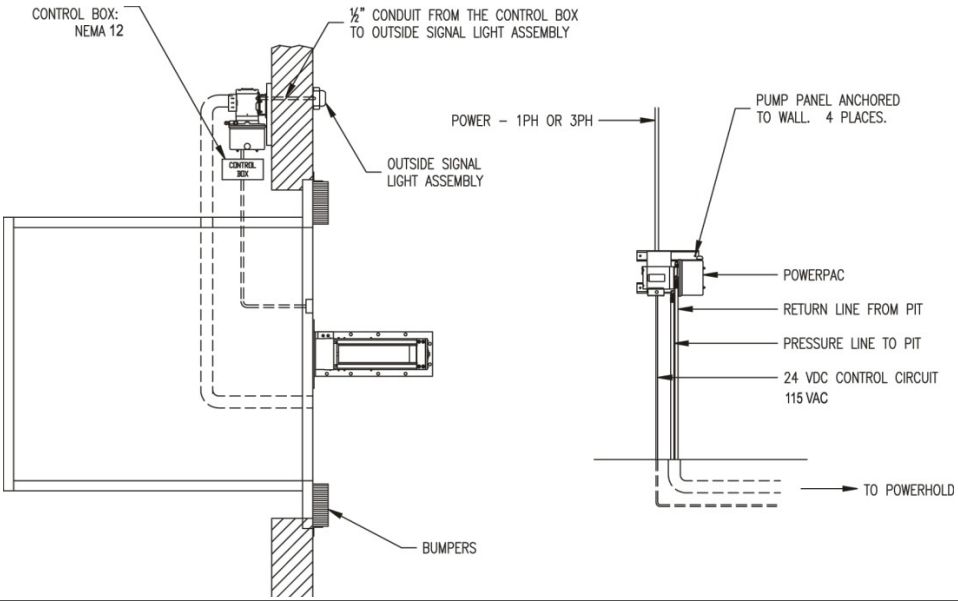
Dock Face (Self Contained)
Appropriate location when the likelihood of flooding, snow removal and damage from trailer/trucks is minimal. Also recommended for use with non-hydraulically powered dock levelers.



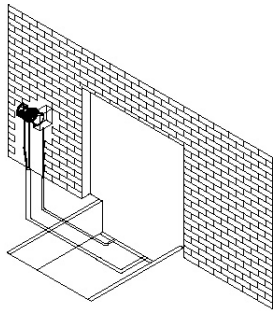
Under The Dock Leveler
When combined with hydraulic leveler pump or remotely mounting under leveler, make certain to locate the powerpack where leveler will not interfere in below dock conditions. The routing of hydraulic and electrical lines from the powerpack to the restraint are best placed through min. 3" PVC (hydraulic) and 3/4" conduit (electrical) chase during pit construction.



POWERHOLD REMOTE MOUNT POWERPACK



Inside Building (Remote Mount)
Locate powerpack to minimize obstruction potential. Hydraulic and electrical lines from the powerpack to the restraint are best placed through min. 3" PVC (hydraulic) and 3/4" (electrical) chase during pit construction.



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POWERAMP
Premium Loading Dock Systems

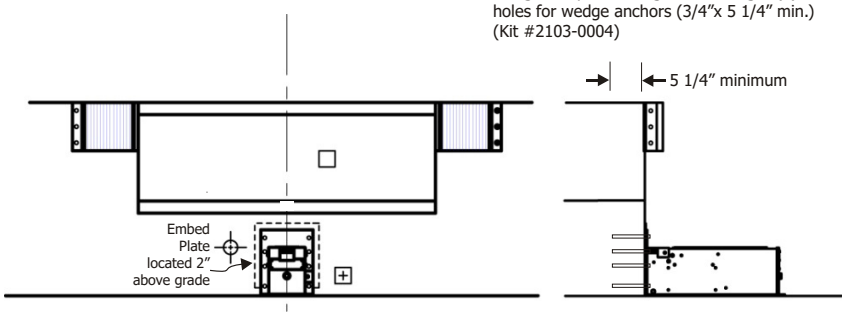
PowerHold Installation Overview

For comprehensive installation instructions read and understand the Installation and Operation Manual.

Concrete Dock Face (Standard installation)

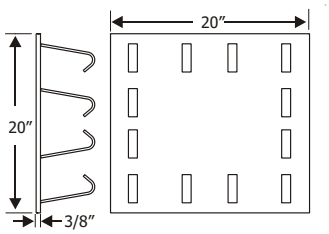
Wedge Anchors Method

Using back plate as a guide, drill eight (8) holes for wedge anchors (3/4"x 5 1/4" min.) (Kit #2103-0004)



Weld Plate Embed Method

Weld three sides of PowerHold back plate to the optional embed mounting plate (Part #7953-0119) with continuous 1/4" fillet weld.

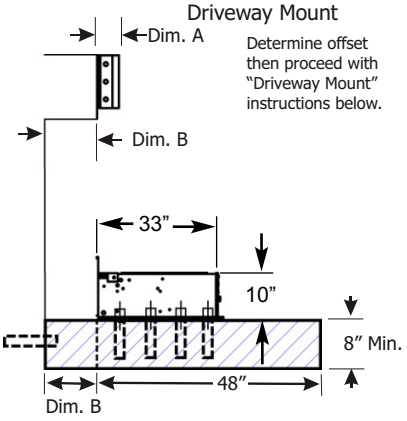


Cantilevered Dock (For bumper projection >4" or cantilevered dock or Edge-of-Dock leveler)

To determine size offset required, take total effective bumper projection (bumper size plus any cantilever) and subtract 4".

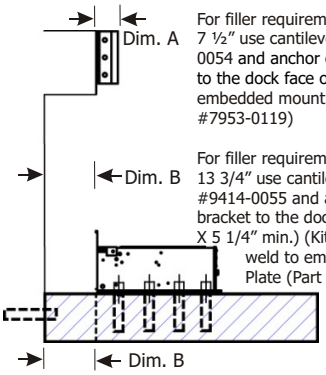
Offset Formula			
Dim. A Bumper Projection	**Dim. B** Cantelever		**Offset**
4"	+ Dim B	-4"	= Offset
6"	+ Dim B		
10"	+ Dim B		
15"	+ Dim B		

Driveway Mount



Determine offset then proceed with "Driveway Mount" instructions below.

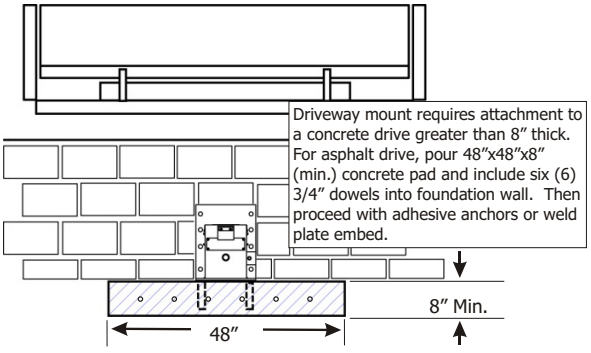
Wall Mount



For filler requirements from 1 ½"to 7 ½" use cantilever bracket #9414-0054 and anchor cantilever bracket to the dock face or weld to embedded mounting plate (Part #7953-0119)

For filler requirements for 8 3/4" to 13 3/4" use cantilever bracket #9414-0055 and anchor cantilever bracket to the dock face (3/4" Dia. X 5 1/4" min.) (Kit #2103-0004) or weld to embedded mounting Plate (Part #7953-0119).

Driveway Mount (Recommended when dock face is unsuitable for PowerHold Mounting)

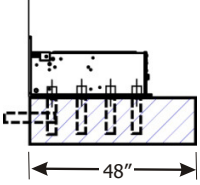


Driveway mount requires attachment to a concrete drive greater than 8" thick. For asphalt drive, pour 48"x48"x8" (min.) concrete pad and include six (6) 3/4" dowels into foundation wall. Then proceed with adhesive anchors or weld plate embed.

Wedge Anchors Method

(Kit #2103-0005)

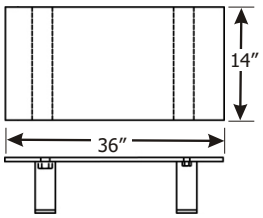
Install nine (9) 3/4" Dia. x 5 1/4" min. wedge anchors at the base of the PowerHold.



Drive Embed Method

Weld method

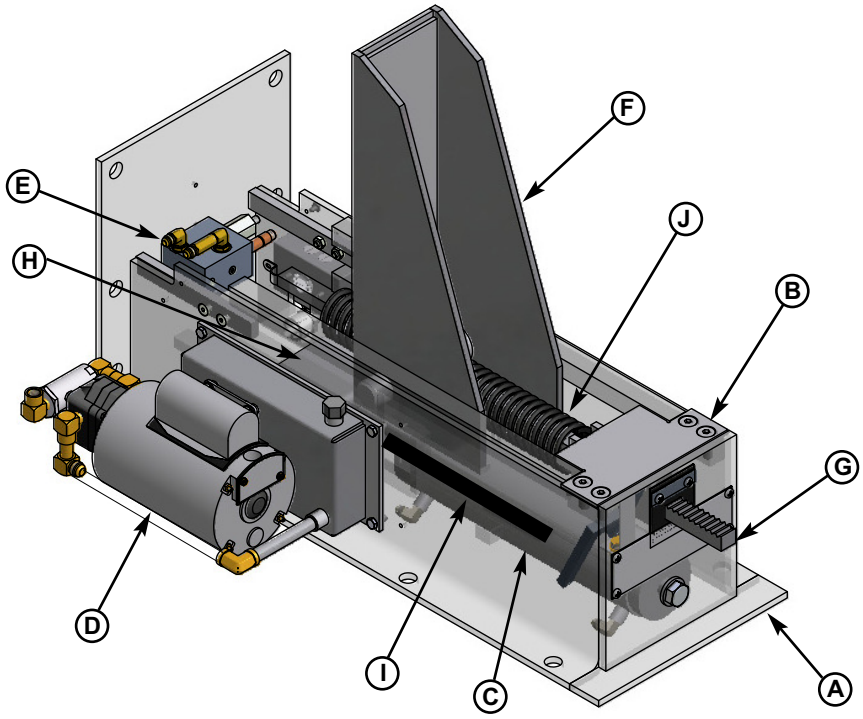
Properly locate and level the drive embed weld plate (Part#7953-0132) in the drive approach. Observe Cantilever conditions for proper positioning. Weld restraint to embed plate with a continuous ¼" filet weld.



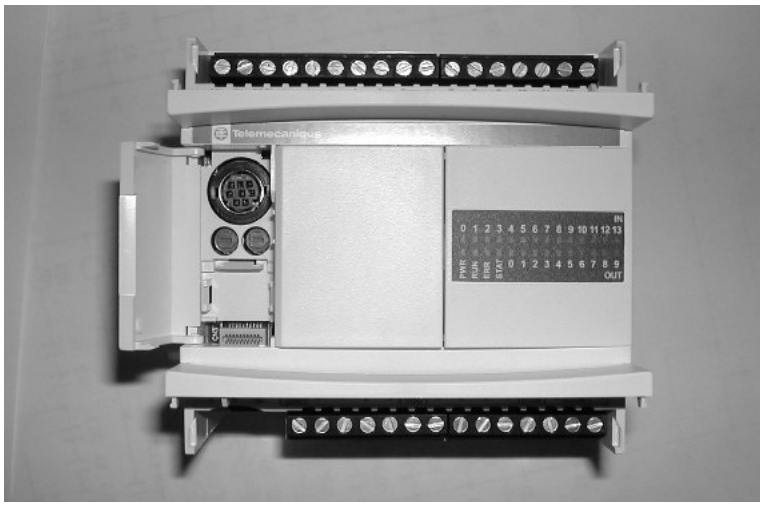
A continuing product improvement process is in effect at Systems, Inc. We reserve the right to make product changes without prior notice.

Poweramp • Division of Systems, Inc. • W194 N11481 McCormick Dr. • Germantown, WI 53022
800.643.5424 • fax: 262.255.4199 • www.DockSystemsInc.com

Component Identification.



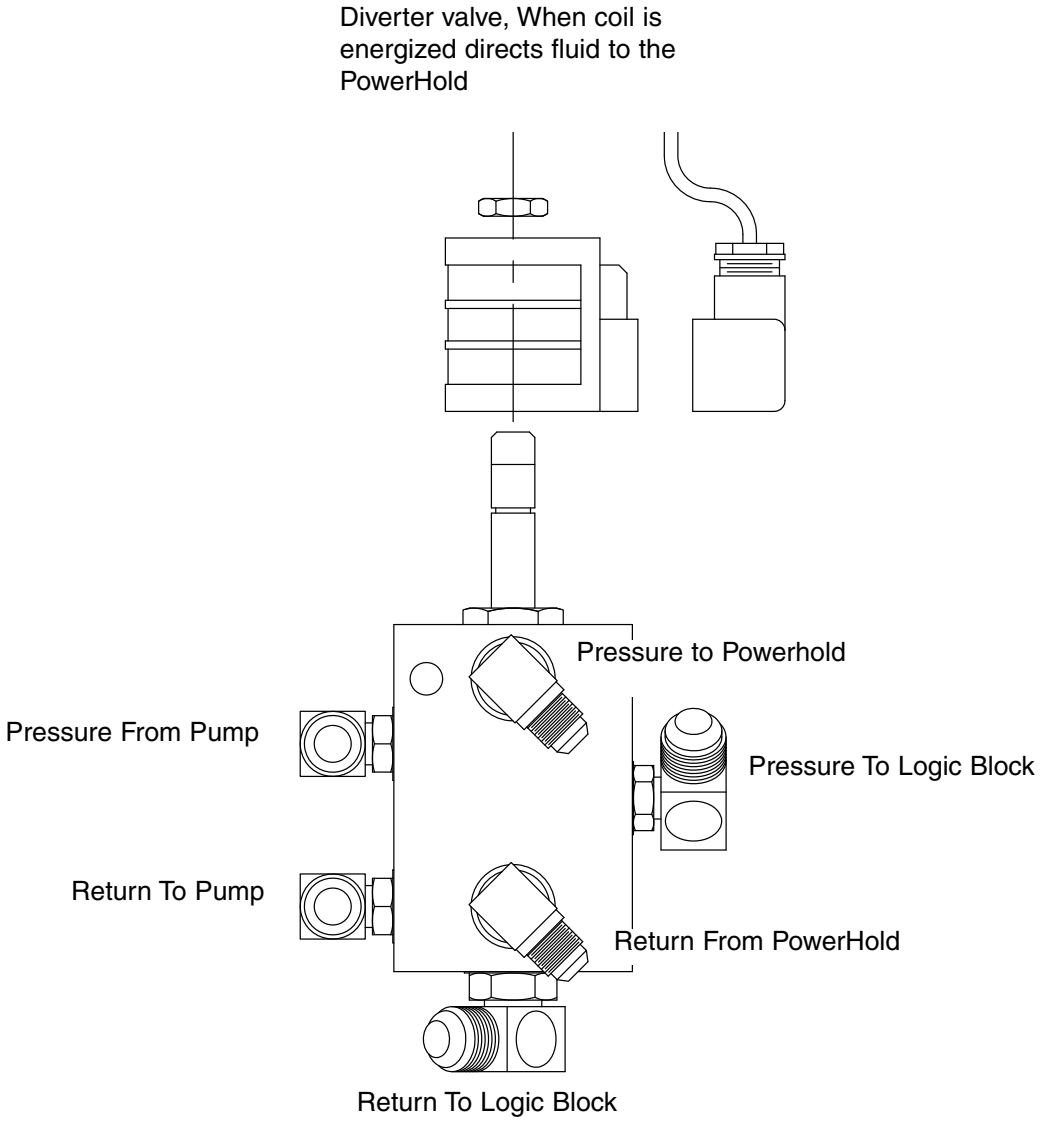
A—Weldment
B—Latch Assembly
C—Hydraulic Cylinder
D—Power Pack SC Only
E—Valve Block
F—Shoe
G—Rack Weldment
H—Slide Block
I—Push Rod
J—Spring



“TWIDO” Programmable Logic Controller

Component Identification

PowerHold manifold with leveler Hose connections.


Diverter valve, When coil is energized directs fluid to the PowerHold
Pressure to Powerhold
Pressure From Pump
Pressure To Logic Block
Return To Pump
Return From PowerHold
Return To Logic Block

OPERATION

Operating Instructions

⚠ DANGER

Stay clear of dock leveler when freight carrier is entering or leaving dock area.

DO NOT move or use the dock leveler if anyone is under or in front of leveler.

Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.

Failure to follow these instructions may result in severe personal injury or death.

⚠ WARNING

Only trained personnel should operate the dock leveler and truck restraint.

DO NOT use a broken or damaged dock leveler or truck restraint. Make sure proper service and maintenance procedures have been performed on equipment before using.

Truck/trailer wheels must be chocked unless the truck restraint is used. Never remove the wheel chocks until loading/unloading is finished and truck driver has been given permission to leave.

Make sure platform lip rests on the truck/trailer bed with at least 4 in. (102 mm) of overlap.

Maintain a safe distance from side edges of leveler during the loading/unloading process.

Failure to follow these instructions may result in serious personal injury or death.

⚠ WARNING

DO NOT overload the dock leveler.

DO NOT operate any equipment while under the influence of alcohol or drugs.

DO NOT leave equipment or material unattended on the dock leveler.

Failure to follow these instructions may result in personal injury and/or damage to equipment.

SEQUENCE OF OPERATION - NORMAL

1. Check that the truck/trailer is positioned squarely against the dock bumpers.
   - Inside Red Light
   - Outside Green Light

2. Push ENGAGE button to activate restraint.
   - Inside Green and Yellow Light
   - Outside Red Light

3. ENGAGED on Truck Restraint.
   - Inside Green Light
   - Outside Red Light

4. Visually inspect restraint for proper engagement.

If RIG (Rear Impact Guard) is damaged or missing, dock leveler can be used in BYPASS

IF BYPASS MODE IS REQUIRED
SEE: SEQUENCE OF OPERATION - BYPASS

FOR NORMAL OPERATION AFTER TRAILER RIG IS ENGAGED CONTINUE WITH: STEP 4

5. Position dock leveler onto truck/trailer.

6. When loading or unloading is complete, return dock leveler to the stored position.

7. Release truck restraint and/or remove chocks from truck/trailer wheels.

SEQUENCE OF OPERATION - BYPASS

1. Check that the truck/trailer is positioned squarely against the dock bumpers.

2. Push ENGAGE button to activate restraint.
   - Inside Green Light, Red Outside Light

3. Visually inspect restraint for proper engagement.

   If RIG (Rear Impact Guard) is damaged or missing dock leveler can be used in BYPASS.

4. If RIG (Rear Impact Guard) is damaged or missing, Shoe will automatically return to the stored position.
   - Inside Amber Light and LED will flash for 30 seconds, then Flash Red (Do Not Enter).
   - Outside Red Light will flash for 30 seconds, then flash Green

5. Secure truck/trailer wheels with wheel chocks.

6. Use key to activate BYPASS mode.
   - Inside Green Light with Amber Caution Light
   - Outside Red Light

7. Position dock leveler onto truck/trailer

8. When loading or unloading is complete, return dock leveler to the stored position.
   -Inside Green Light with Amber Caution Light
   -Outside Red Light

9. Reset BYPASS mode to NORMAL mode by pressing the ENGAGE button once.
   - Inside Red Light, Amber turns Off
   - Outside Green Light
   - Pressing the ENGAGE button during any part of the cycle will end the ENGAGE mode
   - Pressing the LOCK button a second time will cycle the PowerHold.

10. Un-chock the truck/trailer wheels when truck is ready to depart.

PowerHold Light Sequence

CONDITION	LIGHTS	
	INSIDE	OUTSIDE
STORED BEGIN/END	(O/9) RED	(O/8) GREEN
IN MOTION	(O/6) AMBER	(O/7) (O/6) RED & STROBE
HOOKED	(O/5) GREEN	(O/7) RED
OVERRIDE	(O/5) (O/6) GREEN/AMBER	(O/7) (O/6) RED/STROBE
MISSED ICC	(O/6) 30sec (O/4) AMBER (TIME) RED	(O/7) 30sec (O/8) RED (TIME) GREEN STROBE (O/8)
TIMEOUT (FAILURE)	(O/9) (O/6) RED/AMBER	(O/7) (O/6) RED/STROBE
TIMEOUT (FAILURE) IN MOTION	(O/8) AMBER	(O/5) (O/8) RED/STROBE

A NEW LOCK CYCLE OR BYPASS WILL OVERRIDE MISSED ICC

TIMEOUT FAILURE OVERRIDE MISSED ICC

EMERGENCY STOP *(Where Equipped)* OVERRIDES EVERY OTHER CONDITION

WHEN E-STOP IS DEPRESSED	(O/4) RED	(O/5) RED

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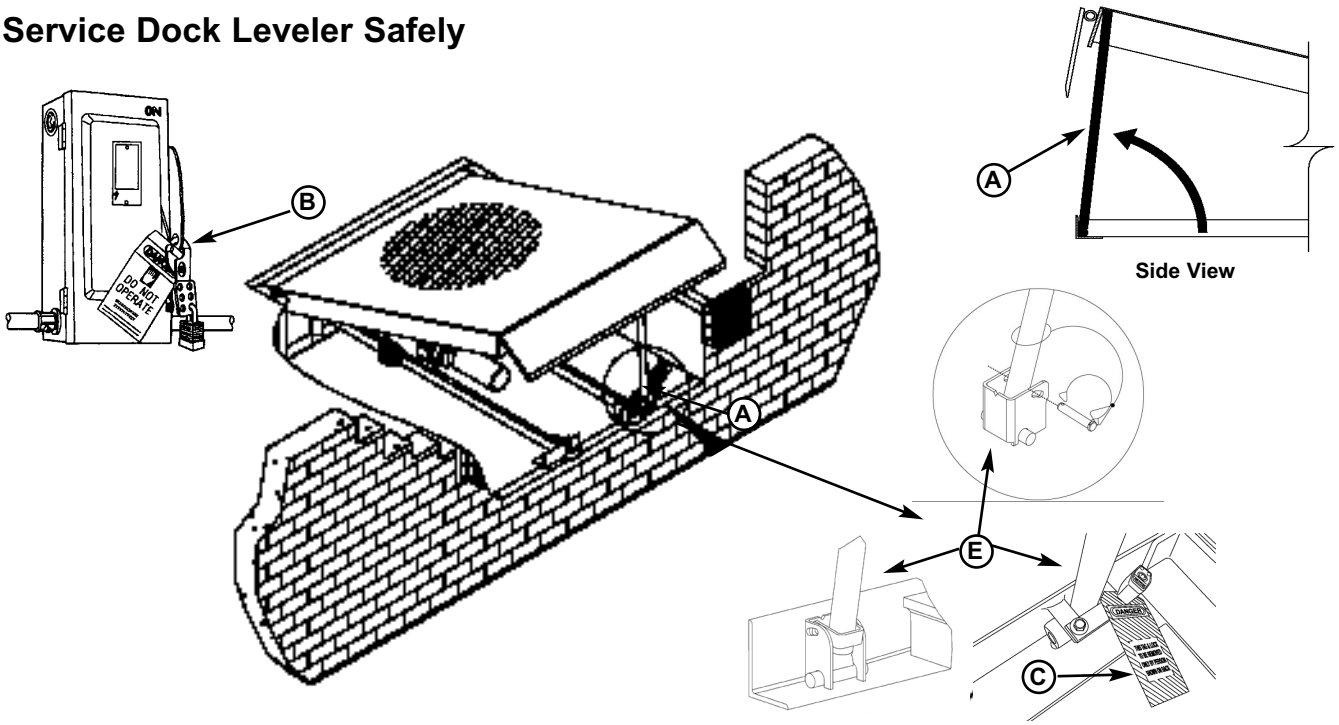
Service Dock Leveler Safely



A—Lip Maintenance Prop **B—Tag Out Device** **C—Lock Out Device** **E.—3 Styles of Lock**

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

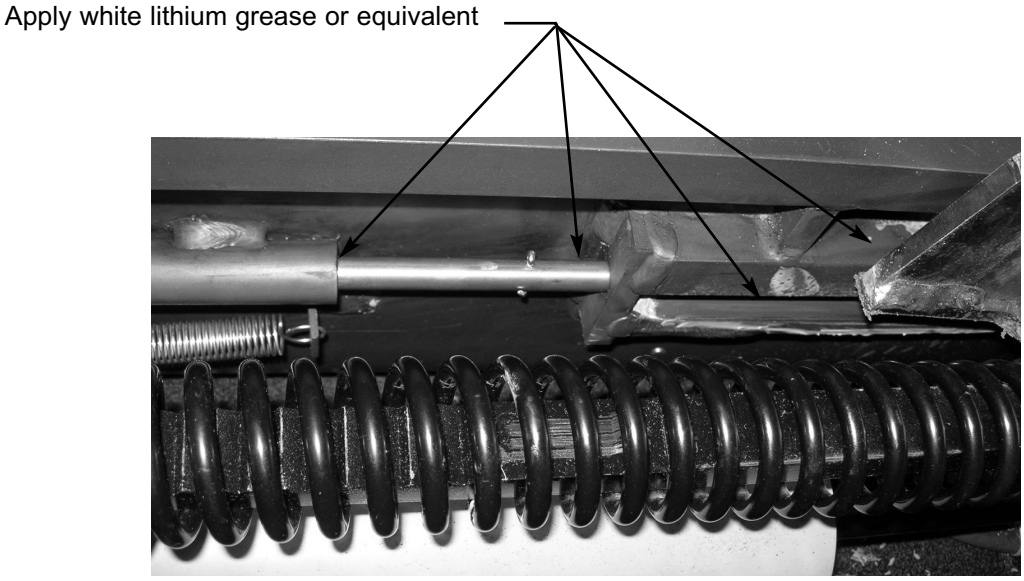
Whenever maintenance is to be performed under the dock leveler platform, support the platform with maintenance prop (E). Position the maintenance prop behind front header plate (F) while staying clear of the lip. The lip will fold down after the platform has rested on the maintenance prop. Lock the maintenance prop in the service (upright) position using an OSHA approved lockout device* (C) and tagout device* (D).

Whenever servicing the dock leveler, lock the electrical power disconnect in the OFF position. Use only an OSHA approved lockout device* (B) and tagout device (A).

Only the person servicing the equipment should have the capability to remove the lockout devices. The tagout devices* must inform that repairs are in process and clearly state who is responsible for the lockout condition.

* Refer to OSHA regulation 1910.147.

Periodic Maintenance



Daily Maintenance

- Make sure that all the Inside and Outside signal lights work.

Weekly Maintenance

- Operate the PowerHold truck restraint through the complete operating cycle to maintain lubrication.

NOTE: - position.

- Inspect the slide block track and push rod areas. The areas must be kept free of dirt and debris. Build-up of foreign material in the track areas will cause abnormal operation.

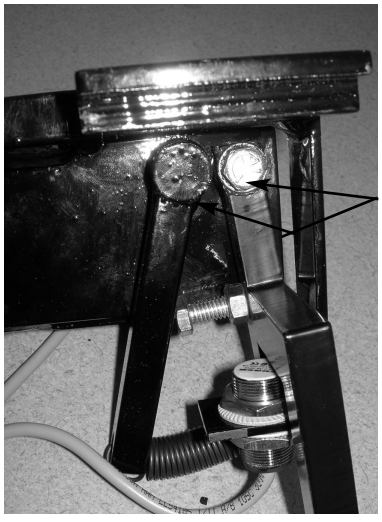
- Lubricate slide block tracks, shoe slots and top of slid block with whit lithium grease

Quarterly Maintenance

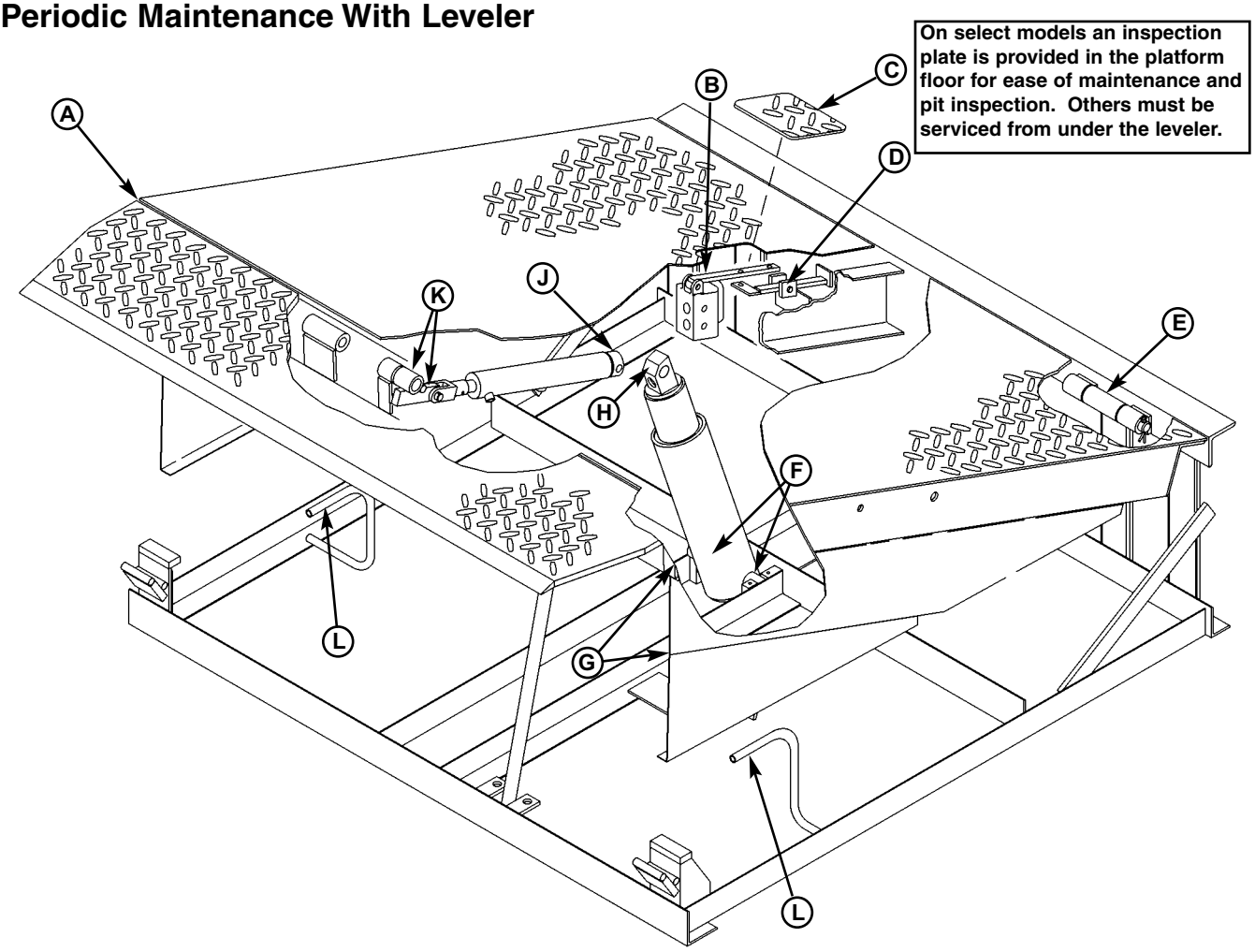
- Clean and Lubricate slide block track and push rod areas. Lubricate pins for the “Z” bar. Inspect and clean Prox switches.

IMPORTANT

Failure to properly lubricate the Truck Restraint will cause abnormal operation of the Restraint



Periodic Maintenance With Leveler



A—Lip Hinge Area
B—Valve Lever Pivot on Logic Block
C—Inspection Plate
D—Dual-Lanyard Lever Pivot
E—Platform Hinge Area
F—Platform Cylinder Trunnion
G—Toe Guard Hinges
H—Platform Cylinder-to-Platform Pin
J—Lip Cylinder-to-Platform Frame Pin
K—Lip Lifter and Lift Cylinder Pin
L—Toe Guard Pivots

⚠ WARNING

Before performing any maintenance under the dock leveler, lock the electrical power source in OFF position and lock the maintenance prop in the service position using an approved locking device. (See Service Dock Leveler Safely in this section.)

Failure to follow these instructions may result in serious personal injury or death.

IMPORTANT

Use of fluids that do not have equivalent specifications to those in the following list will result in abnormal operation of the dock leveler and voiding of warranty.

To ensure normal operation of the dock leveler, use only aircraft hydraulic fluid designed to meet or exceed military specification MIL-L-5606. It is recommended that the following hydraulic fluids be used:

- ULTRA-VIS-HVI-15
- Flomite 530 ZF
- Aero Shell Fluid 4 or Fluid 41
- Mobile Aero HFA Mil-H5606A or Aero HF
- Texaco Aircraft Hydraulic Oil 15 or 5606
- Exxon Univis J13

These fluid brands can be mixed together. Mixing with fluids that do not meet or exceed MIL-L-5606 may damage the equipment and WILL void warranty. Use of hydraulic fluids with equivalent specifications to those listed here are acceptable.

Daily Maintenance

- Make sure that all the Inside and Outside signal lights work.

Weekly Maintenance

- Operate the dock leveler and PowerHold through the complete operating cycle to maintain lubrication.

NOTE: To thoroughly inspect the platform hinge area, put the platform in the full below-dock position.

- Inspect the platform hinge and the lip hinge areas. The hinge areas must be kept free of dirt and debris. Build-up of foreign material in the hinge areas will cause abnormal operation.

Quarterly Maintenance

IMPORTANT

Failure to properly lubricate the dock leveler will cause abnormal operation of the leveler.

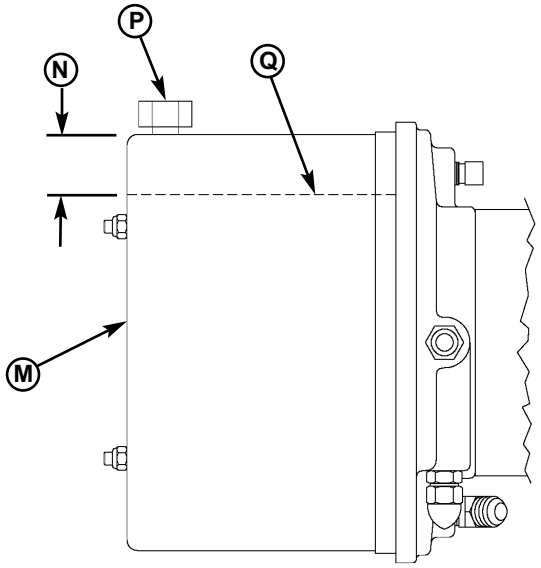
- Lubricate the following areas with light weight machine oil:

  (A)—Lip hinge area unless equipped with grease fittings (apply oil to the top of the entire length of lip hinge when platform is at the full below-dock position and lip is folded).
  (D)—Dual-lanyard lever pivot.
  (E)—Platform hinge area (apply oil to top of all platform hinges when platform is at the full below-dock position).
  (G)—Toe guard hinges (along full length of top and bottom hinges).
  (H)—Platform cylinder-to-platform frame pin.
  (J)—Lip cylinder-to-platform frame pin.
  (K)—Lip lifter and lift cylinder pin.

- Lubricate the following areas with white lithium grease:

  (B)—Valve lever pivot and top of logic block spool valve.
  (F)—All platform cylinder trunnions.
  (L)—Toe guard pivots (where toe guard strut contacts pivot).

NOTE: Apply grease to lip hinge grease fittings if equipped.



M—Reservoir
N—2 in. (51 mm) (From Top of Reservoir)
P—Breather Cap
Q—Fluid Level

IMPORTANT

A low fluid level or the use of hydraulic fluids not equivalent to the fluid types recommended, will cause abnormal operation of the leveler and WILL void warranty.

- Check reservoir fluid level (Q):

  1. Put the dock leveler platform at the full below-dock position.
  2. Turn OFF all electrical power to the leveler.
  3. Remove inspection plate (C).
  4. Remove breather cap (P).
  5. Measure fluid level. The fluid level should be approximately 2 in. (51 mm) (N) from top of reservoir (M) with platform at the below-dock position.
  6. Add hydraulic fluid if necessary. Use only recommended fluid.
  7. Install breather cap and inspection plate.
  8. Turn ON electrical power to the leveler.
  9. Return the platform to the cross-traffic position.

PowerHold Operating Range

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

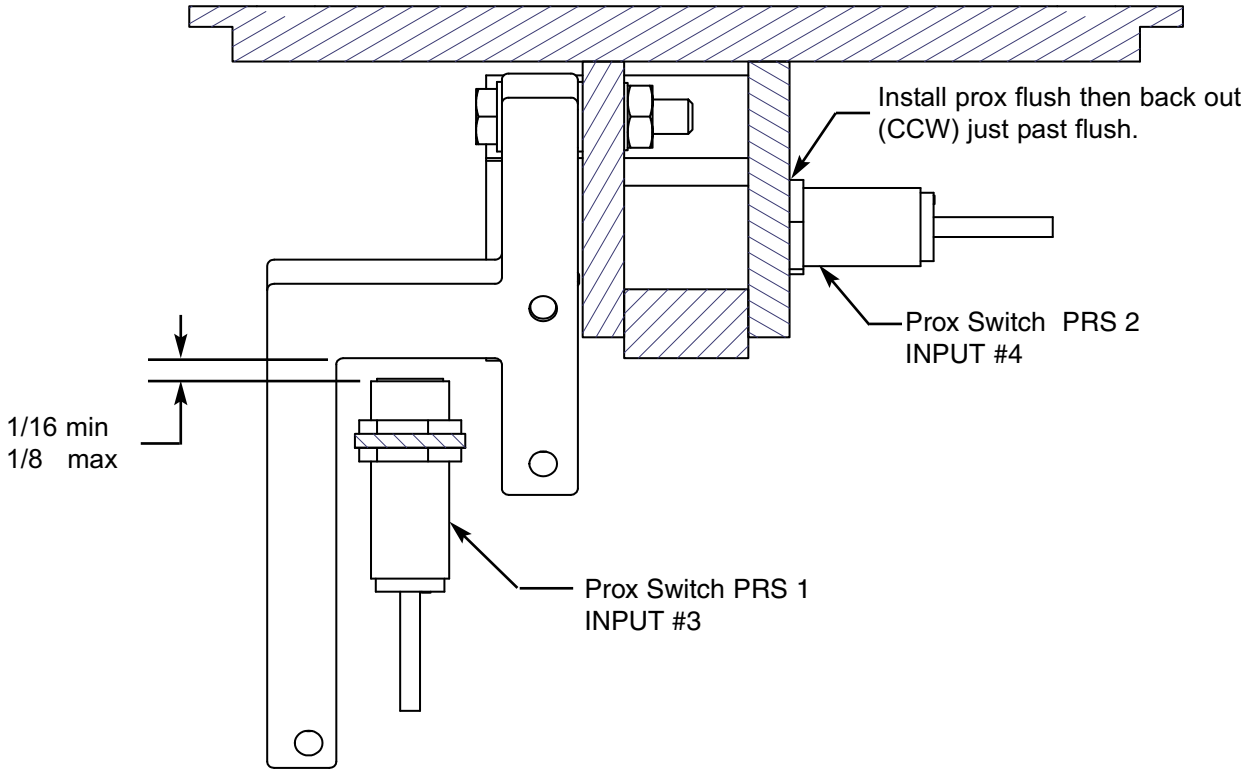
Follow the installation instructions found in the PowerHold Installation & Operation Manual prior to attempting any adjustments.

NOTE: Test operating range of PowerHold without truck/trailer backed into dock.

1. Make sure the selector switch is in Normal and BYPASS mode has not been activated.
   - Red Inside Light, No Amber Light
   - Green Outside Light

2. Momentarily press the ENGAGE button. The PowerHold restraint will raise to 90 deg. NO trailer the restraint will lower back to the stored position. The motor will run additional 6 to 10 seconds in the stored position.
   - Inside Amber Light for 30 seconds, then Red *Alarm will sound if equipped
   - Outside Red Light for 30 seconds, then Green Operating range Refer to page 10.

PowerHold Adjustments



The Operating range is not adjustable on a PowerHold restraint.

Proximity switch Adjustment and replacement.

A. Locate and remove four screws and cover on front of PowerHold assembly.

B. Adjust PRS 1. With the “Z’” bar rotated directly over the prox switch. The prox switch distance should between 1/16” and 1/8”.

C. Adjust PRS 2. The #2 prox switch must be threaded in until flush with the latch block. Turn prox switch out (CCW) until switch is no longer flush with the latch block.

IMPORTANT: Make sure that the wire from the prox switches are clear of all moving parts.

OPTIONAL EQUIPMENT ADJUSTMENTS

Adjust Dock Leveler and Truck Restraint Interlock

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

Dock Leveler and Truck restraint Interlock

The dock leveler can be interlocked with the truck restraint so that the leveler cannot be operated until the restraint has engaged the truck/trailer RIG (Rear Impact Guard) when the OPERATION switch is in NORMAL and has NOT been switched to BYPASS.

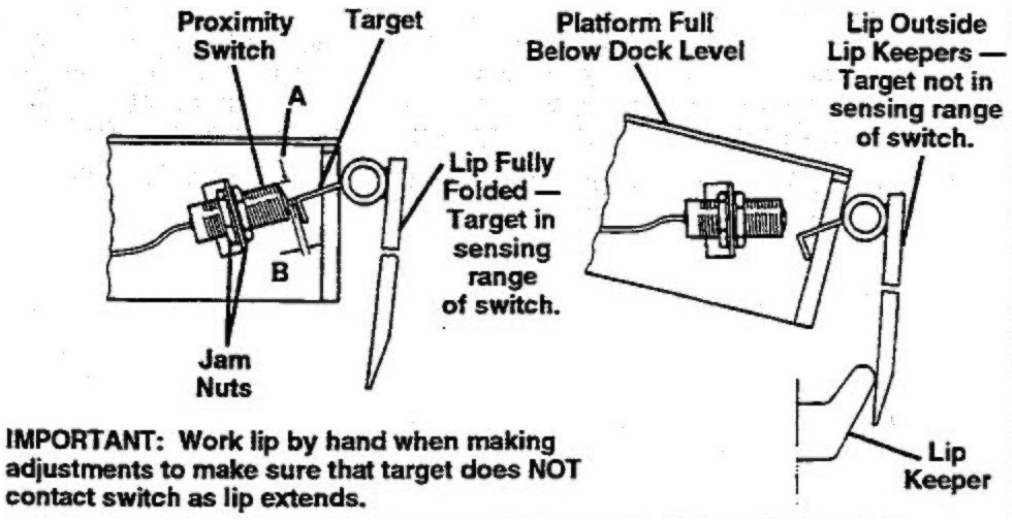
The truck restraint is interlocked with the dock leveler so that the restraint cannot be operated until the leveler is stored in the cross traffic position (lip fully folded, inside the keepers, and the platform level with the dock floor).

Leveler and restraint interlocking are overridden when the OPERATION switch is in BYPASS. The allows the independent operation of the leveler (the restraint cannot be operated in BYPASS).

Pressing the restraint ENGAGE button when in BYPASS mode will return the leveler to NORMAL operating mode.

This option is not available on units equipped with the Auto Return to Dock option.

Adjust & Test Dock Leveler and Truck Restraint Interlock


Proximity Switch
Target
A
B
Jam Nuts
Lip Fully Folded — Target in sensing range of switch.
Platform Full Below Dock Level
Lip Outside Lip Keepers — Target not in sensing range of switch.
Lip Keeper
IMPORTANT: Work lip by hand when making adjustments to make sure that target does NOT contact switch as lip extends.

1. The dock leveler should be in the cross traffic position before beginning tests.

2. Back a truck/trailer with RIG bar into dock. A test fixture may be used to simulate the RIG bar. Use care to avoid damage to the equipment or harm to the operator.

3. Press the RAISE push button. The dock leveler should NOT raise. If the leveler did not raise, proceed with step 4. If the leveler did raise, decrease dimension “A” or “B”, so that the target is in the sensing range of the switch. Typical factory settings for “A” and “B” are approximately 3/4” and 1/8” respectively. Make adjustments at switch (dimension B) and/or target (dimension A) until leveler does not raise when the truck restraint is not engaged at truck trailer RIG bar.

4. Momentarily press the ENGAGE button. The truck restraint automatic engage cycle will be activated and the restraint will engage the truck/trailer RIG bar.

5. Raise the dock by pressing the RAISE button until the lip is fully extended. Release the RAISE button. The leveler will drop to the floor of the truck/trailer. If a RIG test fixture is used it should allow the leveler to drop to the full below dock position without the contact between the lip and test fixture.

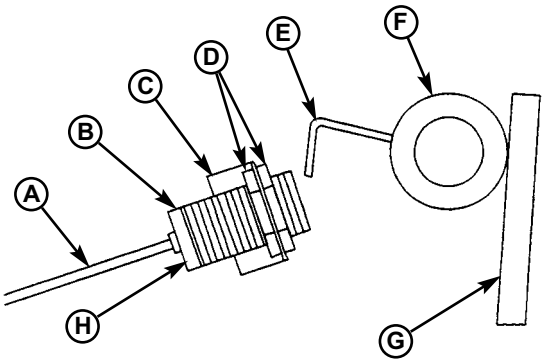
6. Press the RELEASE button. The truck restraint should NOT disengage from the truck/trailer RIG bar or test fixture. If the restraint did NOT engage, proceed with step 7. If the restraint DID disengage, move the switch farther from the target or bend the target so that the target is not in the sensing range of the switch as shown in Figure 37. Make adjustments at switch and/or target until restraint does not disengage truck/trailer.

   IMPORTANT: If adjustments are required in this step, make sure that the interlocking described in step 3 is still in effect after step 6 adjustments are complete.

7. Press the RAISE push button. The dock leveler will raise. The leveler lip will fold as the platform raises. When the lip is fully folded, release the RAISE push button. The leveler will descend to the cross traffic position.

8. Momentarily press the RELEASE button. The truck restraint will return to the stored position.

Adjust Auto Return To Dock (ARTD)



A—Cable
B—Proximity Switch
C—Bracket
D—Lock Nuts
E—Target
F—Lip Hinge Tube
G—Platform Lip
H—Indicator Light

Standard PR levelers are equipped with the Auto Return To Dock (ARTD) unless leveler is interlocked with a truck restraint.

The ARTD allows the platform to automatically return to the cross-traffic (stored) position after the truck departs. The ARTD uses a proximity switch (B) located under the platform and a piece of angled steel called the target (E) that is attached to the lip hinge tube (F).

The proximity switch provides a six-second delay after the platform has lowered to the full below-dock position, after which, the platform will return to the cross-traffic position. The switch also contains an indicator light (H) that can be used for diagnosing and adjusting the switch.

NOTE: Some proximity switches have an indicator light at the back of the housing and some have the light at the side of the housing.

Adjust the ARTD as Follows:

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

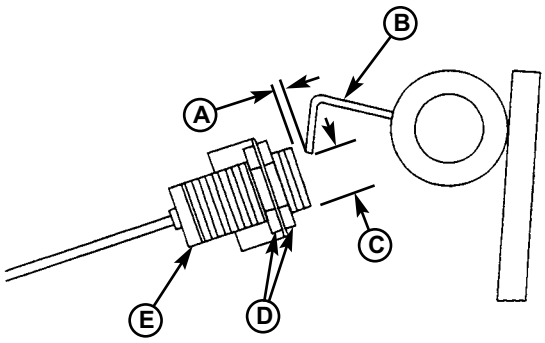
1. Raise platform fully and engage the maintenance prop in the service position. Allow platform to rest on the prop so the lip will fully fold until it contacts the lip stops.

2. Turn OFF all electrical power to the dock leveler. Attach safety lockout and tag-out devices.

IMPORTANT

Anytime proximity switch and target are adjusted, always check for interference between target and switch before operating the leveler. Damage to switch will occur if the target contacts the switch.

The maximum torque for proximity switch lock nuts is 27 N•m (29 lb-ft). Damage to switch will occur if maximum torque is exceeded.



A—1/4 in. (6.4 mm) Approximate
B—Target
C—1 in. (25.4 mm) Approximate
D—Lock Nuts
E—Proximity Switch

NOTE: Distances (A and C) are typical factory settings. Use these dimensions only as a starting point when adjusting the proximity switch and target, especially if switch and/or target have been replaced.

When dimensions (A and C) are obtained, the proximity switch and target may need finer adjustments to get the ARTD to operate satisfactorily.

3. Loosen lock nuts (D). Adjust proximity switch (E) to obtain distance (A). Tighten lock nuts.

4. Bend target (B) as needed to obtain distance (C). Recheck distance (A) and readjust if necessary.

NOTE: At least two people may be required to manually move the lip.

5. After adjusting proximity switch and target, slowly move the lip up by hand while observing the target and proximity switch. The target MUST NOT contact the switch, otherwise, damage to switch will occur. Readjust switch and/or target if necessary, then recheck for interference.

6. Turn ON electrical power to the dock leveler.

7. Disengage the maintenance prop.

8. Turn the ARTD switch (on control panel) to the ON position.

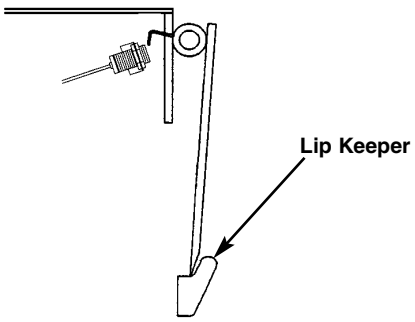
9. Raise the platform until the lip is fully extended, then allow the platform to drift to the below-dock position.

   After approximately 6 seconds, the platform must return to the cross-traffic position.

10. Adjust the proximity switch and target as necessary. Make small adjustments, then operate the dock leveler to check results. Do this until satisfied with the ARTD operation.

    Use the following illustrations to assist in fine tuning and/or diagnosing the ARTD operation.

Cross-Traffic Position

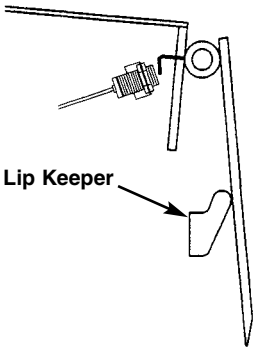


NOTE: The platform lip is fully folded when the platform is at the cross-traffic (stored) position (lip engaged with keepers) or when platform is resting on the maintenance prop.

Whenever the platform lip is at the cross-traffic position, the following conditions will exist for a normally operating ARTD:

- Target not in the sensing area of proximity switch.
- Proximity switch OFF (open) (no signal sent to control panel).
- Proximity switch indicator light is OFF.
- Platform stays at this position unless the operator activates the leveler.

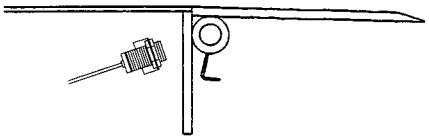
Full Below-Dock Position



Whenever the platform lip is at the full below-dock position, the following conditions will exist for a normally operating ARTD:

- Proximity switch senses target.
- Proximity switch ON (closed) (signal sent to the control panel).
- Proximity switch indicator light is ON.
- Platform will automatically rise after approximately a six-second delay, then returns to the cross-traffic position.

Lip Fully Extended Position



Whenever the platform lip is at the fully extended position, the following conditions will exist for a normally operating ARTD:

- Target not in the sensing area of proximity switch.
- Proximity switch OFF (open) (no signal sent to the control panel).
- Proximity switch indicator light is OFF.
- If the platform lip is resting on the truck bed, the platform will stay at this position unless the operator activates the leveler.

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

Before performing the detailed troubleshooting procedures, check the following items first:

- Check all fuses inside the control panel(s). Replace any blown fuse(s) with a fuse of equal specification.
- Make sure the correct voltages are present at the proper locations inside the control panel(s).

Symptom	Possible Cause	Solution
Inside and outside signal lights do not operate. Controller (PLC) RUN indicator is on solid (not flashing). Unit operates as normal.	Bad Flasher.	Replace flasher with wire. If lights operate (lights will not flash), replace flasher.
Restraint does not operate. Motor does not energize.	Motor overload device tripped.	Reset overload relay (3 phase) or replace fuse (1 phase) or reset breaker (1 phase-new models). Determine cause of device tripping. ***NOTE:*** *If replacing fuse, use fuse with equal specification .*
	Motor starter (3 phase) or motor relay (1 phase) not energizing. Combination Leveler and P-Hold Only.	Check controller output that sends a signal to starter or relay. Output may have failed OPEN. Use meter to check for contact closure when output ON.

TROUBLE SHOOTING POWERHOLD

Symptom	Possible Cause	Solution
Three-phase units only: Restraint does not operate. Motor energizes but does not run. **If motor hums, but does not run, overload device should trip.** **Combination Leveler and P-Hold Only.**	3 Phase units only - no voltage is present on one line. *NOTE: A motor that is missing voltage on one line is said to be single-phased.*	Check for blown fuses at branch circuit disconnect. Replace fuse. Determine cause of blown fuse.
		Check motor starter as follows: 1. Disconnect wires at load side of starter. 2. Energize the starter. 3. Measure line-to-line voltage at line side of starter. 4. Measure line-to-line voltage at load side of starter. 5. Line-side and load-side voltages should be approximately the same. Replace starter if voltage values are considerably different from one another.
		Check all wiring to motor for high resistance or no connection.
		Replace motor.
Three-phase units only: Restraint does not operate. Motor runs in reverse	Phase reversed.	Reverse any two legs at the branch circuit disconnect.
Single-phase units only: Restraint does not operate. **Motor energizes, but does not run.**	Line voltage too low.	Check wiring to motor for high resistance. Check for loose or corroded connections. Check if gauge of wires to motor are of correct size and specification for load requirement. Replace if necessary.
	Defective motor centrifugal switch.	Replace motor.
	Defective motor capacitor.	Replace motor.
	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
Restraint operates slowly.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Pressure relief valve set too low. **(combination unit only)**	See pressure relief adjustments on page 48. ***NOTE:*** *The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* **The full load amp value can be found on the inside cover of the control panel.*
	Power Hold raises Slow or Slow to release (SC Power Hold Only)	-Pressure Relief cartridge adjusted per max amp draw.
	Damage or blocked hydraulic hose(s) and/or valve(s).	Replace damaged hose(s). Check and remove blockage from hose(s) and/or valve(s).

Symptom	Possible Cause	Solution
Restraint does not fully raise or motor overcurrent device and/or overload device continuously tripping.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Debris in Tank	Drain and clean tank. I debris cannot be cleaned out replace tank.
Restraint does not raise.	Solenoid Not energized.	Locate solenoid (See Page 40 & 41). Coil must be energized when P-Hold is in engage mode. -Check valve for Magnetism at the coil
	Bad Spool Valve	Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage “O” rings on valve). ***NOTE:*** *Do not over tighten valve into block. Max Torque: 10-15 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
Restraint does not raise but leveler raises. (combination unit only)	Solenoid Not energized.	Locate solenoid (See Page 39). Coil Must be energized when P-Hold is in engage mode. -Check valve for Magnetism at the coil.
	Bad Spool Valve	Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage “O” rings on valve). ***NOTE:*** *Do not over tighten valve into block. Max Torque: 10-15 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.

TROUBLE SHOOTING POWERHOLD

Symptom	Possible Cause	Solution
Restraint will not lower to release truck.	Solenoid staying energized.	Relay or PLC contact is stuck contacts. Test coil for Magnetism (see page 40,41). Coil must be de-energized to release the truck.
	Bad Spool Valve.	Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage “O” rings on valve). ***NOTE:*** *Do not over tighten valve into block. Max Torque: 10-15 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures.
Restraint will not lower but leveler raises. (combination unit only)	Solenoid not Energized.	Locate solenoid (See Page 48). Coil must be energized when P-Hold is in engage or disengaged. -Check valve for Magnetism at the coil
	Bad Spool Valve	Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. Carefully wipe valve with clean rag (do not damage “O” rings on valve. -Check valve block for contaminant's. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 10-15 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.

Symptom	Possible Cause	Solution
Restraint raises makes contact with ICC bar but does not lock. Then returns to stored position.	Improper location of P-Hold	Power Hold must have a 4" set back from bumper SEE page 10.
	Prox switch	1. Check prox switch #1 and #2. When metal is placed in front of prox the led light on the prox will light up. When the led on the prox is lit the inputs#3 and #4 on the plc will also be lit. -Shorted or open prox switch -open or shorted wires -Bad prox switch.
	Activation of #1 prox switch	Input 4 must come on first. The restraint shoe must make contact with the ICC bar. The restraint shoe will rotate as the hydraulic extends. The Slide block on the hydraulic cylinder push The rod. The rod will make contact with the Z bar. The Z bar will pass over the #1 prox switch. Input #3 will light on the PLC. The power hold then shut off. -Frozen or rusted push rod -Bend or damaged Z bar -adjustment to prox maybe required
	Activation of #2 prox switch	The restraint shoe must make contact with the ICC bar. The restraint shoe will rotate the ratchet will pass in front of the #2 prox switch, input #4
Platform does not rise. Pump operates in pressure relief mode.	Heavy object(s) on platform.	Remove object(s) from platform. *NOTE: For safety reasons, the dock leveler is designed to lift only the platform's own weight.*
	Dock leveler binds.	Check for visible obstructions that could cause binding. Remove obstructions. If no obstructions found, call Poweramp Technical Services. See inside back cover for phone number and address.
	Pressure relief set too low.	Increase pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* **The full load amp value can be found on the inside cover of the control panel.*

TROUBLE SHOOTING DOCK LEVELER

Symptom	Possible Cause	Solution
Platform rises slowly.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Contaminated hydraulic system.	Clean and inspect valves. Flush contaminated oil from hydraulic system. Fill system with new oil. See Periodic Maintenance in the Maintenance section.
	Damaged or restricted hydraulic hose(s).	Replace damaged hose(s). Remove restriction.
	Pressure relief set too low.	Increase pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* **The full load amp value can be found on the inside cover of the control panel.*
Pump motor loads down when platform reaches the full raised position.	Pressure relief set too high.	Decrease pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* **The full load amp value can be found on the inside cover of the control panel.*
Shoe does not rise to full height.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
Platform DOES rise to full height, but lip DOES NOT extend or extend fully.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Logic block (valve) lever cable weight too low on cable.	Adjust cable weight. See Adjust Cable Weight and Down Speed Control in the Adjustment section.

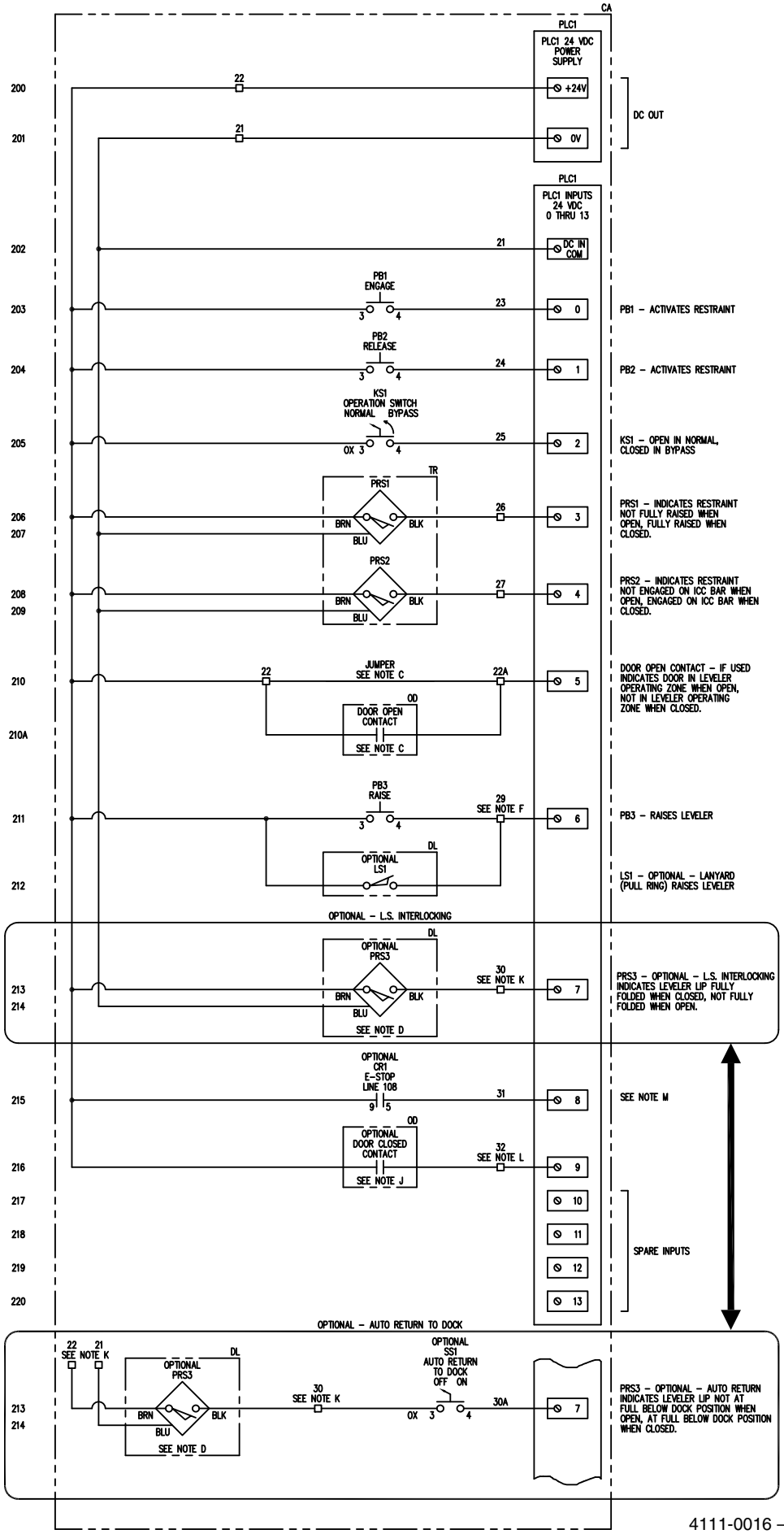
TROUBLESHOOTING DOCK LEVELER

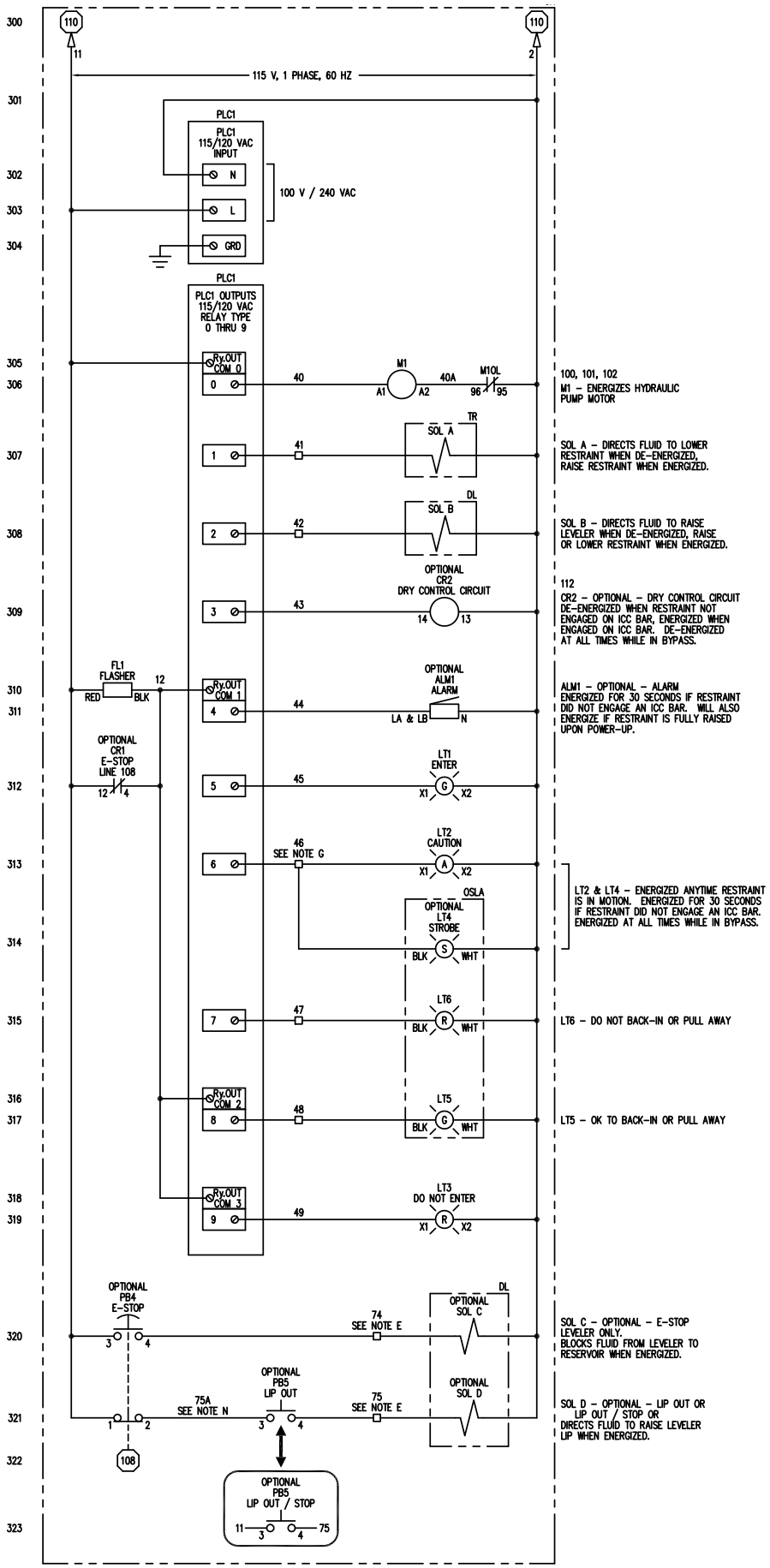
Symptom	Possible Cause	Solution
Platform locks into "safety" as platform lowers. Lip drops to vertical position.	Platform lowering speed is too fast.	Adjust platform down speed control. See Adjust Cable Weight and Down Speed Control in the Adjustment section. *NOTE: Extreme cold weather OR incorrect fluid may cause platform to lock. Adjustment is same.*
Dock leveler equipped with ARTD: Platform does not automatically return to the cross-traffic position or operates abnormally.	The auto return proximity switch not sensing target correctly.	Adjust proximity switch and target as necessary. See Adjust Auto Return To Dock (ARTD) in the Adjustment section.
	Defective proximity switch.	Replace switch.
	Broken wire. Loose or corroded wire connections.	Repair or replace wires and connections as necessary.

LADDER LOGIC POWERHOLD W/LEVELER

#1 Prox Switch
See Page 23

#2 Prox Switch
See Page 23


CA
PLC1
PLC1 24 VDC POWER SUPPLY
+24V
0V
DC OUT
PLC1
PLC1 INPUTS 24 VDC 0 THRU 13
DC IN COM
PB1 ENGAGE
PB1 – ACTIVATES RESTRAINT
PB2 RELEASE
PB2 – ACTIVATES RESTRAINT
KS1 OPERATION SWITCH NORMAL BYPASS
KS1 – OPEN IN NORMAL, CLOSED IN BYPASS
PRS1
TR
BRN
BLK
BLU
PRS1 – INDICATES RESTRAINT NOT FULLY RAISED WHEN OPEN, FULLY RAISED WHEN CLOSED.
PRS2
PRS2 – INDICATES RESTRAINT NOT ENGAGED ON ICC BAR WHEN OPEN, ENGAGED ON ICC BAR WHEN CLOSED.
JUMPER SEE NOTE C
OD
DOOR OPEN CONTACT
SEE NOTE C
DOOR OPEN CONTACT – IF USED INDICATES DOOR IN LEVELER OPERATING ZONE WHEN OPEN, NOT IN LEVELER OPERATING ZONE WHEN CLOSED.
PB3 RAISE
PB3 – RAISES LEVELER
DL
OPTIONAL LS1
LS1 – OPTIONAL – LANYARD (PULL RING) RAISES LEVELER
OPTIONAL – L.S. INTERLOCKING
OPTIONAL PRS3
SEE NOTE D
PRS3 – OPTIONAL – L.S. INTERLOCKING INDICATES LEVELER LIP FULLY FOLDED WHEN CLOSED, NOT FULLY FOLDED WHEN OPEN.
OPTIONAL CR1 E-STOP LINE 108
SEE NOTE M
OPTIONAL DOOR CLOSED CONTACT
SEE NOTE J
SEE NOTE L
SPARE INPUTS
OPTIONAL – AUTO RETURN TO DOCK
OPTIONAL SS1 AUTO RETURN TO DOCK OFF ON
PRS3 – OPTIONAL – AUTO RETURN INDICATES LEVELER LIP NOT AT FULL BELOW DOCK POSITION WHEN OPEN, AT FULL BELOW DOCK POSITION WHEN CLOSED.


300
110
11
110
2
115 V, 1 PHASE, 60 HZ
301
PLC1
PLC1
115/120 VAC
INPUT
302
N
100 V / 240 VAC
303
L
304
GRD
PLC1
PLC1 OUTPUTS
115/120 VAC
RELAY TYPE
0 THRU 9
305
Ry.OUT
COM 0
306
0
40
M1
A1
A2
40A
M10L
96
95
100, 101, 102
M1 – ENERGIZES HYDRAULIC
PUMP MOTOR
TR
SOL A
307
1
41
SOL A – DIRECTS FLUID TO LOWER
RESTRAINT WHEN DE–ENERGIZED,
RAISE RESTRAINT WHEN ENERGIZED.
DL
SOL B
308
2
42
SOL B – DIRECTS FLUID TO RAISE
LEVELER WHEN DE–ENERGIZED, RAISE
OR LOWER RESTRAINT WHEN ENERGIZED.
OPTIONAL
CR2
DRY CONTROL CIRCUIT
309
3
43
14
13
112
CR2 – OPTIONAL – DRY CONTROL CIRCUIT
DE–ENERGIZED WHEN RESTRAINT NOT
ENGAGED ON ICC BAR, ENERGIZED WHEN
ENGAGED ON ICC BAR. DE–ENERGIZED
AT ALL TIMES WHILE IN BYPASS.
FL1
FLASHER
12
RED
BLK
310
Ry.OUT
COM 1
311
4
44
OPTIONAL
ALM1
ALARM
LA & LB
N
ALM1 – OPTIONAL – ALARM
ENERGIZED FOR 30 SECONDS IF RESTRAINT
DID NOT ENGAGE AN ICC BAR. WILL ALSO
ENERGIZE IF RESTRAINT IS FULLY RAISED
UPON POWER–UP.
OPTIONAL
CR1
E–STOP
LINE 108
12
4
312
5
45
LT1
ENTER
G
X1
X2
313
6
46
SEE NOTE G
LT2
CAUTION
A
X1
X2
OSLA
OPTIONAL
LT4
STROBE
314
S
BLK
WHT
LT2 & LT4 – ENERGIZED ANYTIME RESTRAINT
IS IN MOTION. ENERGIZED FOR 30 SECONDS
IF RESTRAINT DID NOT ENGAGE AN ICC BAR.
ENERGIZED AT ALL TIMES WHILE IN BYPASS.
315
7
47
LT6
R
BLK
WHT
LT6 – DO NOT BACK–IN OR PULL AWAY
316
Ry.OUT
COM 2
317
8
48
LT5
G
BLK
WHT
LT5 – OK TO BACK–IN OR PULL AWAY
318
Ry.OUT
COM 3
319
9
49
LT3
DO NOT ENTER
R
X1
X2
OPTIONAL
PB4
E–STOP
3
4
320
74
SEE NOTE E
DL
OPTIONAL
SOL C
SOL C – OPTIONAL – E–STOP
LEVELER ONLY.
BLOCKS FLUID FROM LEVELER TO
RESERVOIR WHEN ENERGIZED.
OPTIONAL
PB5
LIP OUT
75A
SEE NOTE N
1
2
321
3
4
75
SEE NOTE E
OPTIONAL
SOL D
SOL D – OPTIONAL – LIP OUT OR
LIP OUT / STOP OR
DIRECTS FLUID TO RAISE LEVELER
LIP WHEN ENERGIZED.
108
322
OPTIONAL
PB5
LIP OUT / STOP
11
3
4
75
323

PROGRAMMING

ISSUES FOR PROGRAMMING.
- Error light is flashing, PLC is either missing or damaged.
- Update to newer program
- Installation of new un programmed PLC

MATERIAL REQUIRED.
You will receive two (2) E-proms
- Blank run E-Prom.
- Program Specific E-Prom.

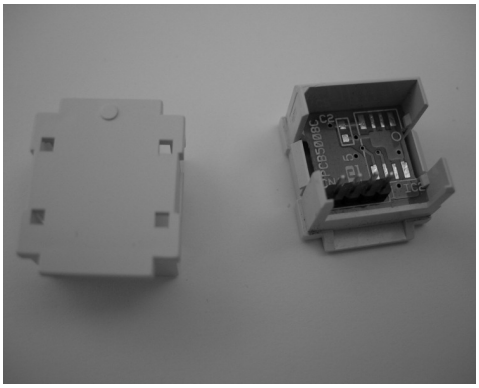
INSTALLATION
1. Turn power off power. (remove existing E-Prom if present).
2. Insert new “Blank Run” E-Prom.
3. Turn power on for 30 seconds.
4. Turn power off for 10 seconds repeat cycle 3 times.

- Insert program chip (program specific)

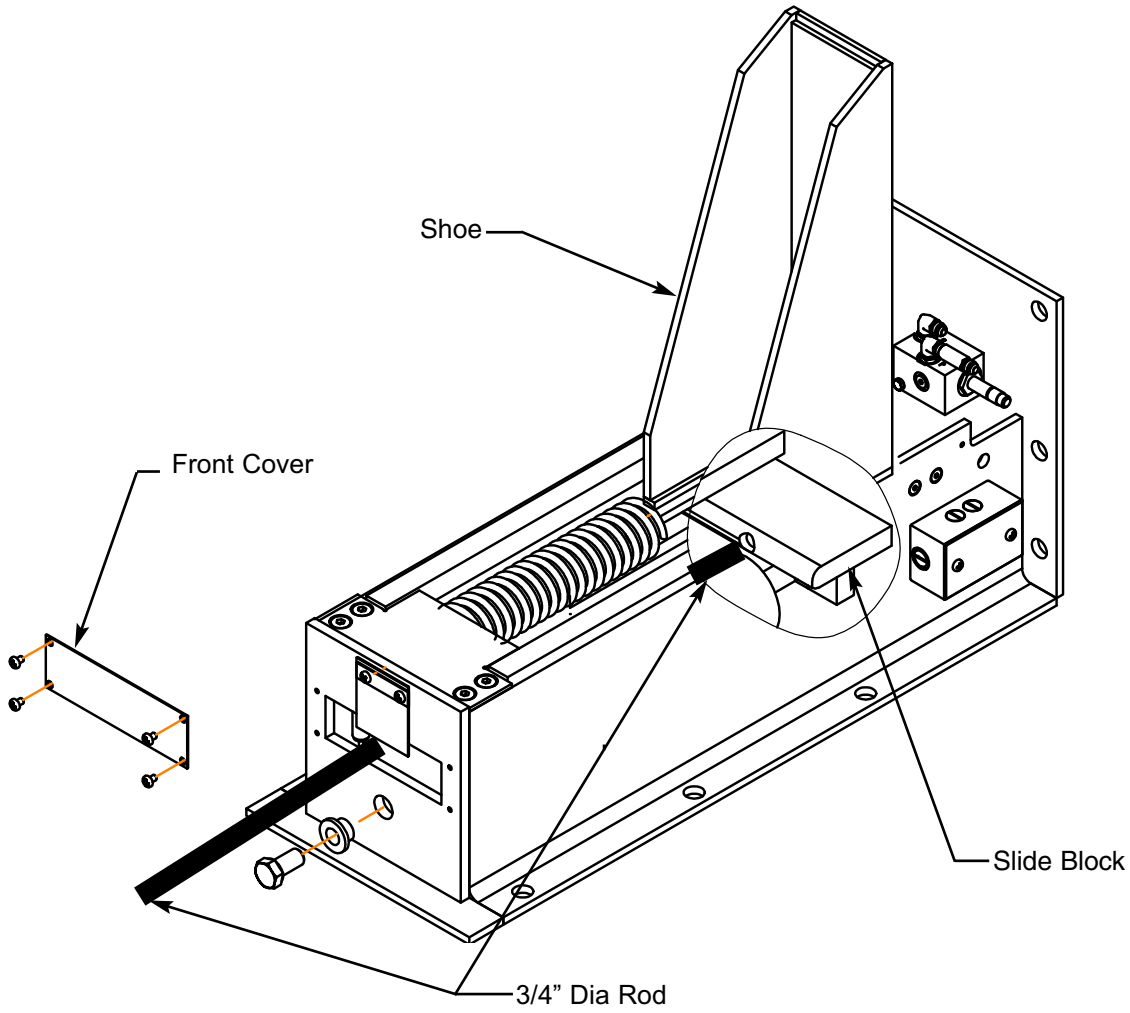
Repeat steps 1,3 and 4. Allow light sequence to complete flashing. Run light should be on STEADY *not flashing*. Error light should NOT be *on*. Check for proper input and out put lights on the PLC.
If not, repeat steps 3 and 4 until PLC responds properly. If the PLC does not accept the program or if questions contact the “Tech Service Department” at 800-643-9424.

Note: The PLC will maintain the program even if the power is turned off.

Twido PLC



E-Prom



Tools required:

Large Hammer

3/4” Dia Rod Two Foot Lg.

Manual release.

- Lock out / tag out leveler.
- Remove front cover plate (4 screws)
- Remove bolt and washer holding cylinder in place.
- Install 3/4’ rod through front opening. Rod will fit in the slide block.
- Hammer 3/4 rod (4 to 5 hits) until the slide block travels past the shoe.

-The shoe will then drop.

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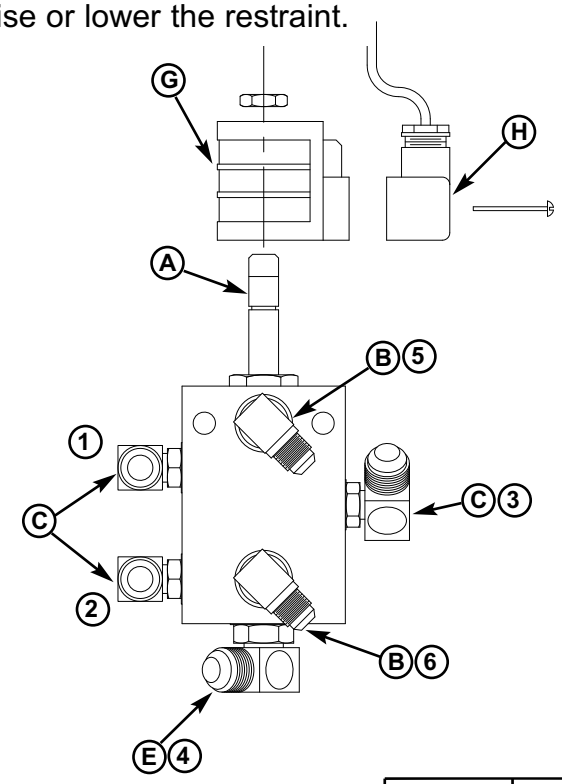
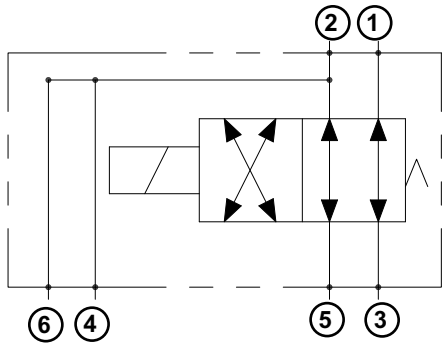
Valve Block Combination PowerHold and Leveler

Coil De-energized to raise Leveler.
Energized to raise or lower the restraint.

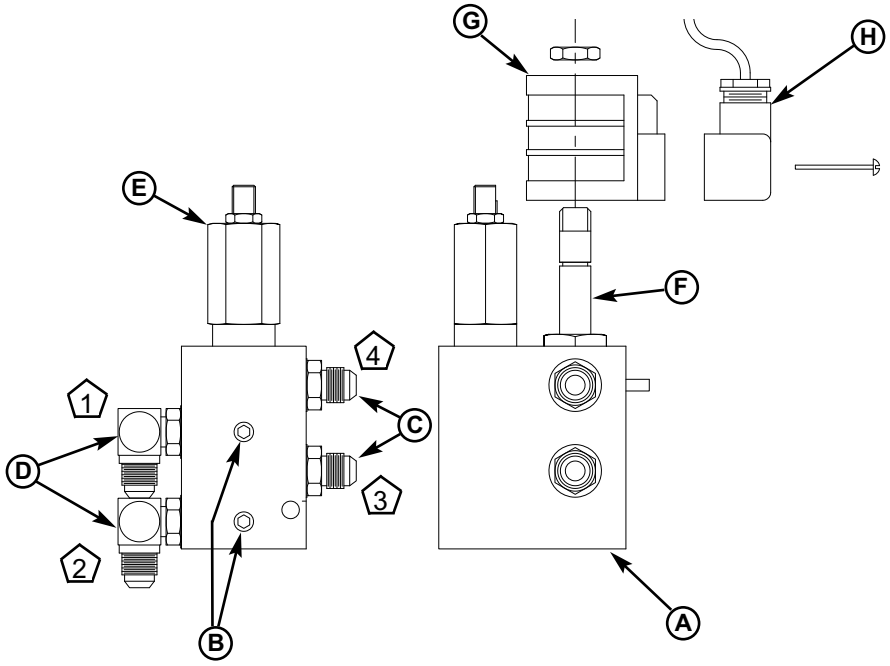


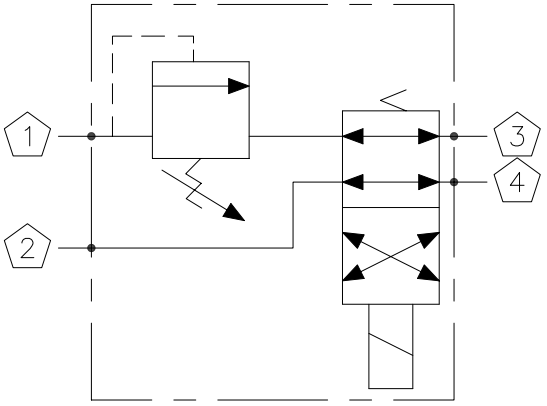


NOTE	DESCRIPTION
1	PRESSURE FROM PUMP
2	RETURN TO PUMP
3	PRESSURE TO LOGIC BLOCK
4	RETURN FROM LOGIC BLOCK
5	PRESSURE TO POWERHOLD
6	RETURN FROM POWERHOLD

Item	Quantity	Part Number	Description
A	1	8581-0011	4 Way Cartridge Valve
B	2	9301-0113	Fitting Elbow 90 Deg STR Thread #6 ORB x #6 JIC
C	1	9301-0115	Fitting Elbow 90 Deg STR Thread #6 ORB x #8 JIC
E	1	8581-0016	Fitting Elbow 90 Deg STR Thread #8 ORB x #8 JIC
F	1	8583-0115	Complete Valve assembly
G	1	8581-0004	Coil, Delta
H	1	4301-0001	Cable Assembly 48” Lg

PowerHold Valve Block SC





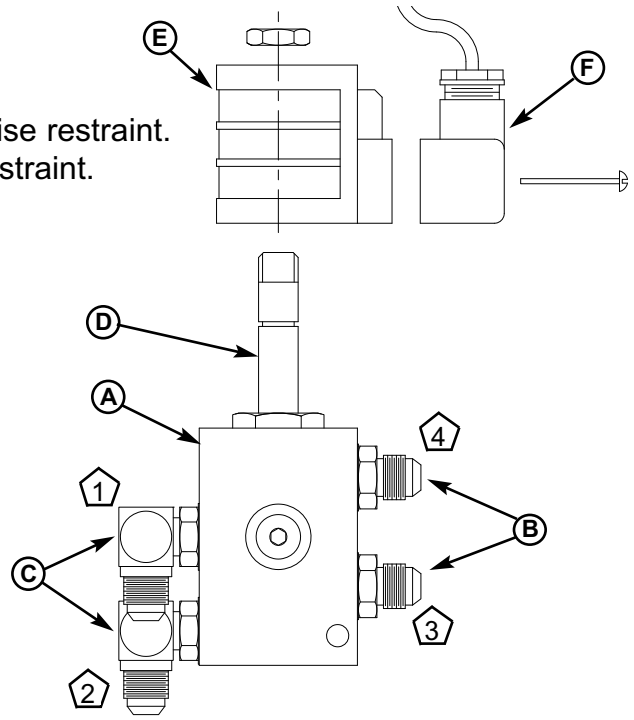
NOTE	DESCRIPTION
1	PRESSURE FROM PUMP
2	RETURN TO TANK
3	TO BLIND END OF POWERHOLD CYLINDER
4	TO ROD END OF POWERHOLD CYLINDER

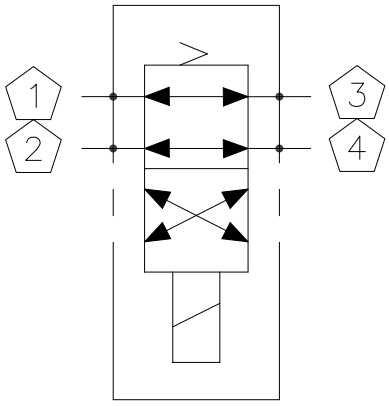
Item	Quantity	Part Number	Description
A	1		Hydraulic Valve Body
B	2	9571-0007	Fitting Pipe Plug 1/8 NPT
C	2	9301-0109	Fitting Conn STR Thread
D	2	8581-0113	Fitting Elbow 90 Deg #6 ORB x #6 JIC
E	1	8581-0115	Valve Cartridge Relief
F	1	8581-0011	Valve Cartridge 4-Way
G	1	8581-0004	Coil, Delta
H	1	4305-0319	Cable Assembly 22” Lg
I	1	8583-0017	Complete Valve Assembly

*Provide dock leveler and/or PowerHold serial number when calling or faxing orders.

PowerHold Valve Block

Coil must be energized to raise restraint.
De-energized to lower the restraint.

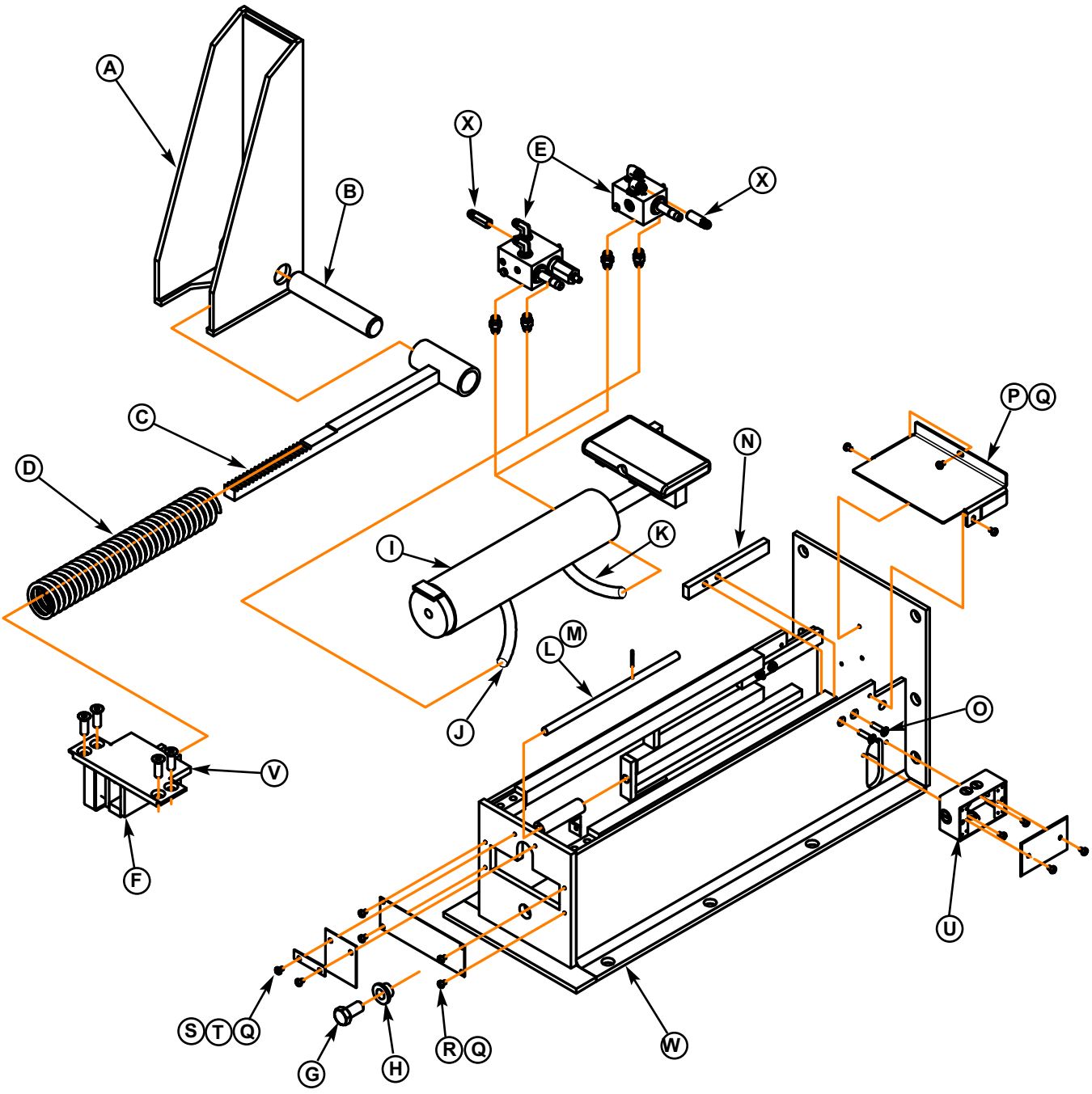




NOTE	DESCRIPTION
1	PRESSURE FROM PUMP
2	RETURN TO TANK
3	TO BLIND END OF POWERHOLD CYLINDER
4	TO ROD END OF POWERHOLD CYLINDER

Item	Quantity	Part Number	Description
A	1		Valve Manifold
B	2	9301-0109	Fitting Connection STR #6 ORB TO 36 JIC
C	2	9301-0113	Fitting Elbow 90 Deg STR Thread #6 ORB x #6 JIC
D	1	8581-0011	Valve Cartridge 4-Way
E	1	8581-0004	Coil, Delta
F	1	4305-0319	Cable Assembly 22” Lg
G	1	8583-0016	Complete Valve assembly

*Provide dock leveler and/or PowerHold serial number when calling or faxing orders.

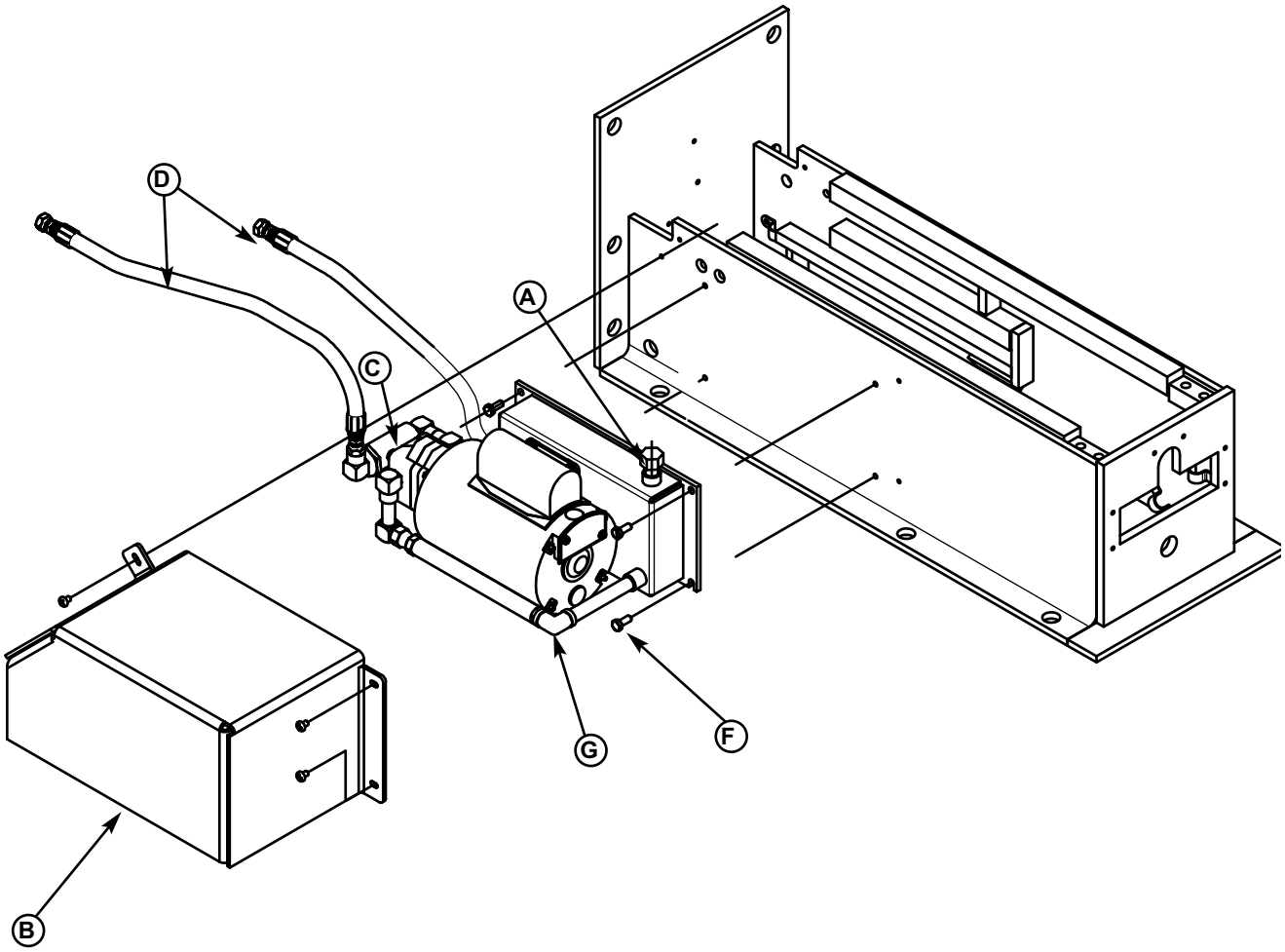


*Provide dock leveler and/or PowerHold serial number when calling or faxing orders.

PowerHold Break Down

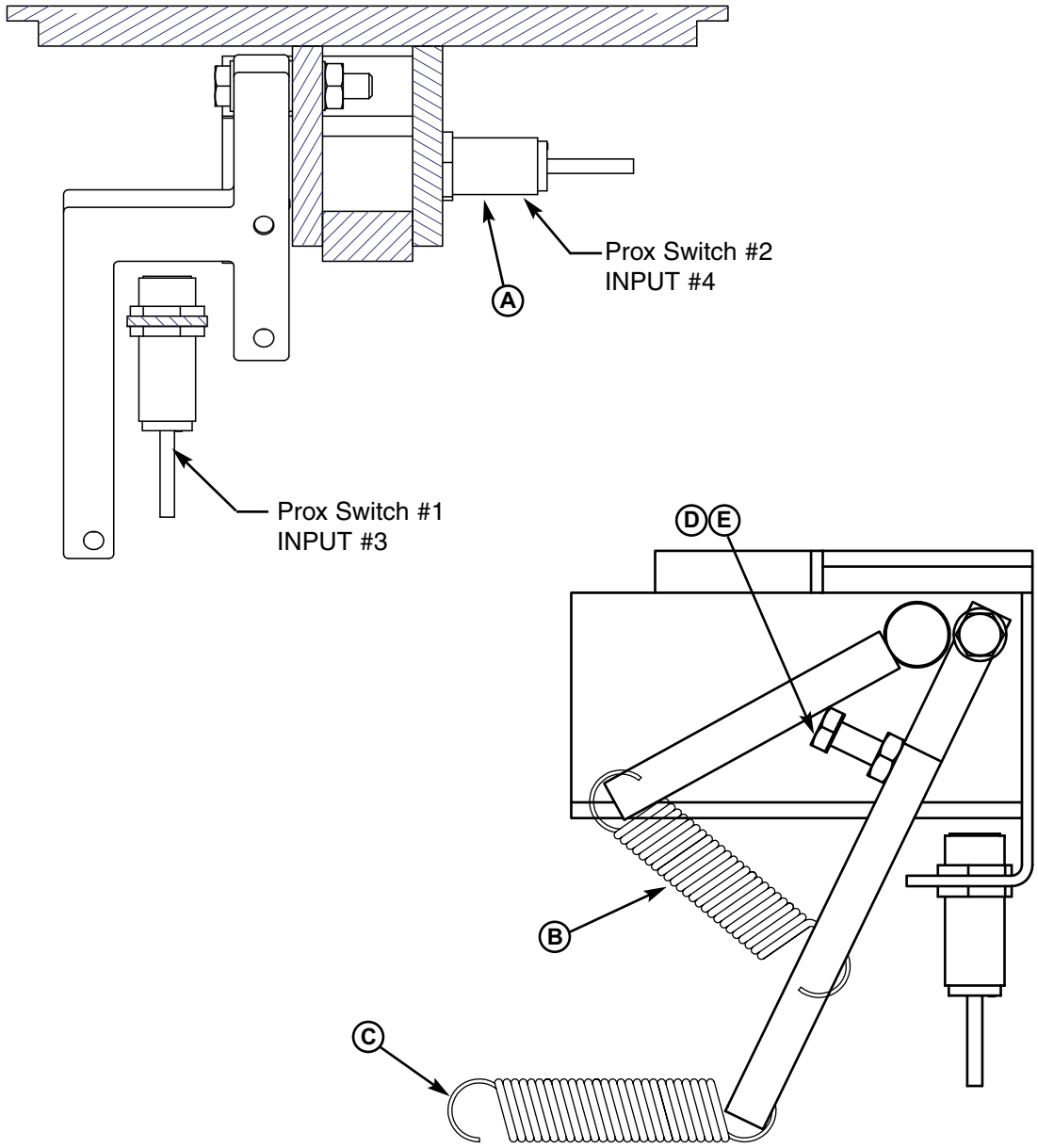
Item	Quantity	Part Number	Description
A	1	9414-0064	Restraint Shoe
B	1	9412-0030	Pin 1-1/2 X 8 LG
C	1	9414-0021	Rack Weldment
D	1	9411-0005	Spring, Rack Weldment
E	1	8583-0017	Valve Block SC
		8583-0016	Valve Block with leveler
F	1	9414-0065	Latch Block Assembly (Includes Prox Switches)
G	1	2101-0118	Bolt 3/4-10 UNC X 1-1/2 LG
H	1	2101-0119	Bushing
I	1	9414-0073	Cylinder Complete (Includes Slide Block and Hoses)
J	1	9904-0059	Hose, 35” Lg. #6 Jic Swivel Both Ends
K	1	9904-0155	Hose, 21” Lg. #6 Jic Swivel Both Ends
L	1	9412-0095	Push Rod
M	1	2101-0045	Cotter Pin, 1/8 x 1.00
N	2	9412-0063	Removable Track Stop
O	4	2101-0009	Bolt 5/16-18
P	1	9411-0046	Access Cover, Top
Q	14	2101-0099	Screw 1/4-20 UNC x 3/8
R	1	9411-0012	Cover, Front
S	1	9411-0007	Weather Seal, Hold Down
T	1	0192-0016	Weather Seal, Ratchet
U	1	2753-0001	J-Box, Cover and Gasket SC (includes screws)
		2753-0002	J-Box, Cover and Gasket Remote (includes screws)
V	4	2101-0074	Screw, Allen Head 1/2-20 UNC x 1-1/2 Lg.
W	1	9414-0063	Base Weldment
X	1	8581-0137	One Way Check Valve

PowerHold SC Power Pac



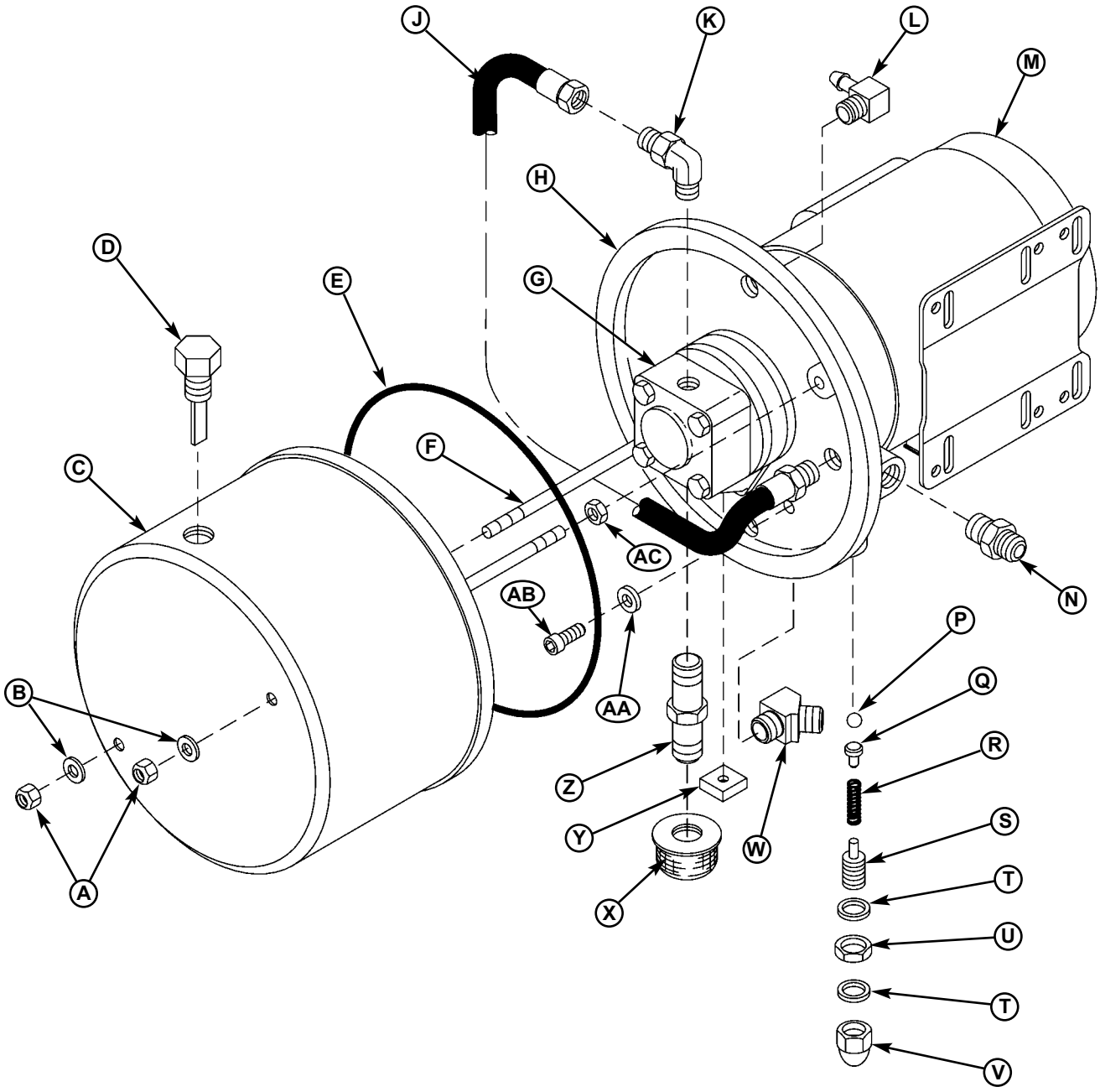
Item	Quantity	Part Number	Description
A	1	9301-0199	Breather Cap
B	1	9411-0047	Cover, Power Pac
C	1	9301-0085	Filter 3/8 NPT
D	2	9904-0051	Hose, 16.00” LG 3/8 NPTM / #6 Jic Swivel Female
F	7	2101-0009	Bolt 5/16-18 UNC 3/4 Lg.
G	1	9395-0022	Power Pac Complete, SC

PowerHold SC



Item	Quantity	Part Number	Description
A	2	0963-0073	Prox Switch
B	1	0941-0008	Spring
C	1	0941-0009	Spring
D	1	2101-0012	Bolt 5/16-18 UNC
E	1	2101-0202	Nut, Hex 5/16-18 UNC
F	1	2101-0203	Latch Weldment
F	1	9414-0065	Latch Assembly (Complete With Prox Switches)

Power Pack Assembly Remote Mount

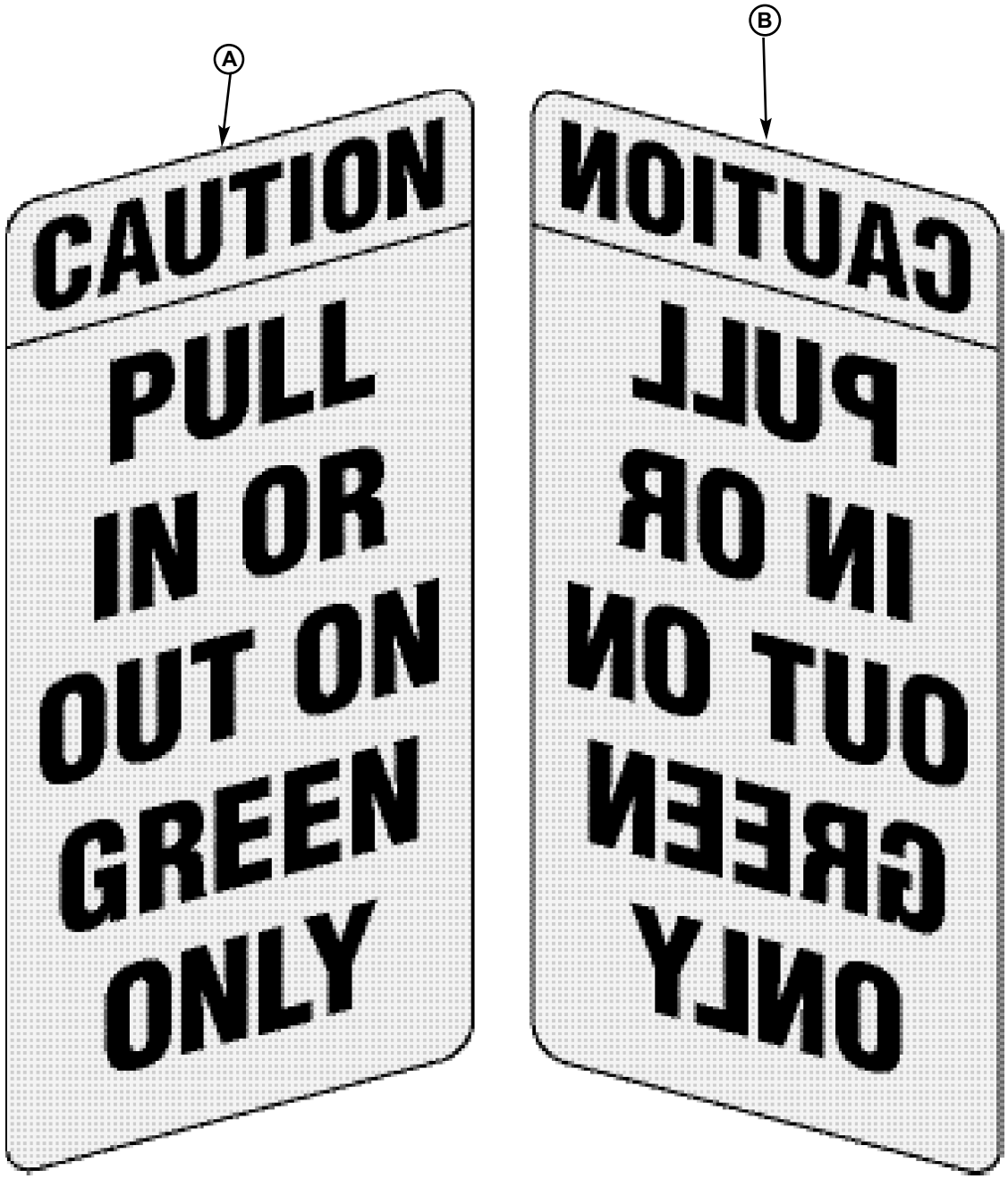


Power Pack Assembly Remote Mount

Item	Quantity	Part Number	Description
A	2	2101-0039	Nylon Lock Nut, 5/16-18 UNC
B	2	9301-0029	Seal, Thread
C	1	9302-0014	Reservoir
D	1	9301-0199	Breather Cap, 3/8 NPT Male
E	1	9301-0027	O-Ring (Reservoir)
F	2	9302-0012	Tie Rod (Reservoir)
G	1	9301-____[1]	Pump Only
	4	2101-0016	Cap Screw, 5/16-18 UNC x 3-1/2 in., Grade 5
	1	9301-0028	Gasket, Pump
	1	9303-0002	Coupling Assembly
H	1	9302-0017	Plate, Drive
J	1	9904-0001	Hose
K	1	0521-0017	90° Elbow, 3/8 NPT Male x #8-JIC Male
L	1	0521-0007	90° Elbow, 1/4 NPT Male x 1/4 Tube
M	1	3411-____[2]	Motor Only
N	1	0521-0015	Straight Fitting, 3/8 NPT Male x #8-JIC Male
P	1	0521-0014	Ball, Check
Q	1	9301-0024	Guide, Check Ball
R	1	9302-0009	Spring, Relief Valve
S	1	9303-0003	Screw, Adjusting
T	2	9301-0014	Washer, Nylon, 11/16 in. OD x 1/2 in. ID
U	1	9301-0015	Nut, Jam, 1/2-20 UNF
V	1	9301-0016	Nut, Acorn, 1/2-20 UNF
W	1	0521-0016	45° Elbow, 3/8 NPT Male x #8-JIC Male
X	1	9301-0009	Strainer, Suction
Y	1	9301-0082	Magnet
Z	1	9301-0008	Pipe Nipple, 3/8 NPT x 3 in.
AA	2	9301-0003	Washer, Aluminum, 9/16 in. OD x 3/8 in. ID x 1/16 in.
AB	2	9301-0004	Screw, Socket Head, 3/8-16 UNC x 1-3/4 in.
AC	2	2101-0063	Nut, Jam 5/16-18 UNC
	1	9395-____[1]	Power Pack Complete (Includes All Items Except L, N, and W)

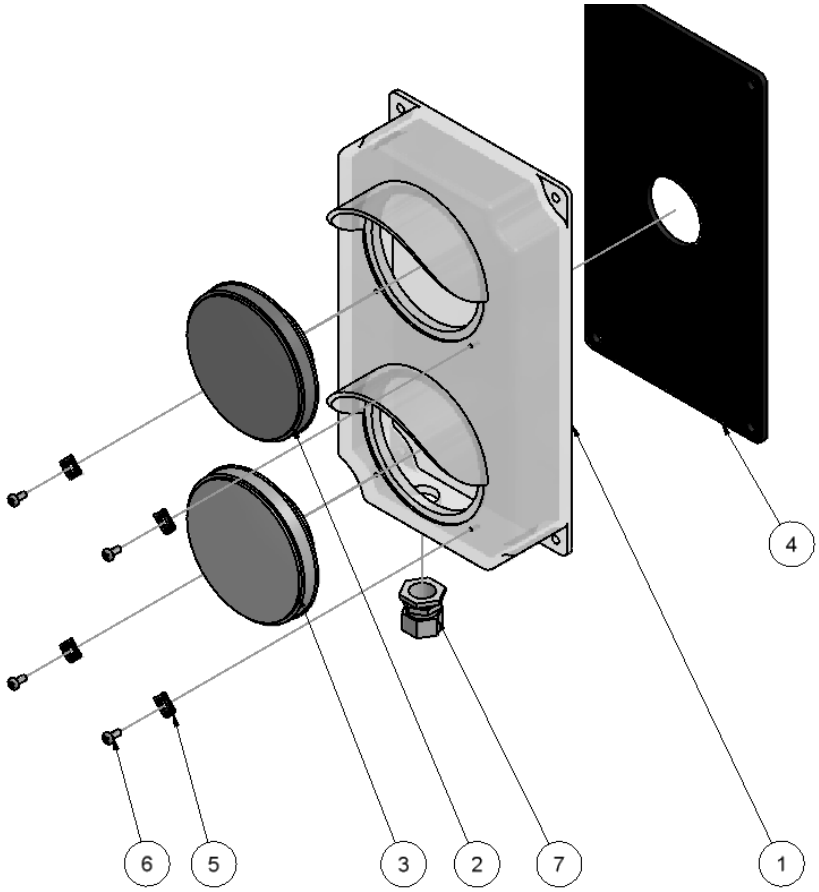
[1] Provide dock leveler serial number and type of installation when calling or faxing orders.
[2] Provide dock leveler serial number, voltage, and phase when calling or faxing orders.

Outside Signs



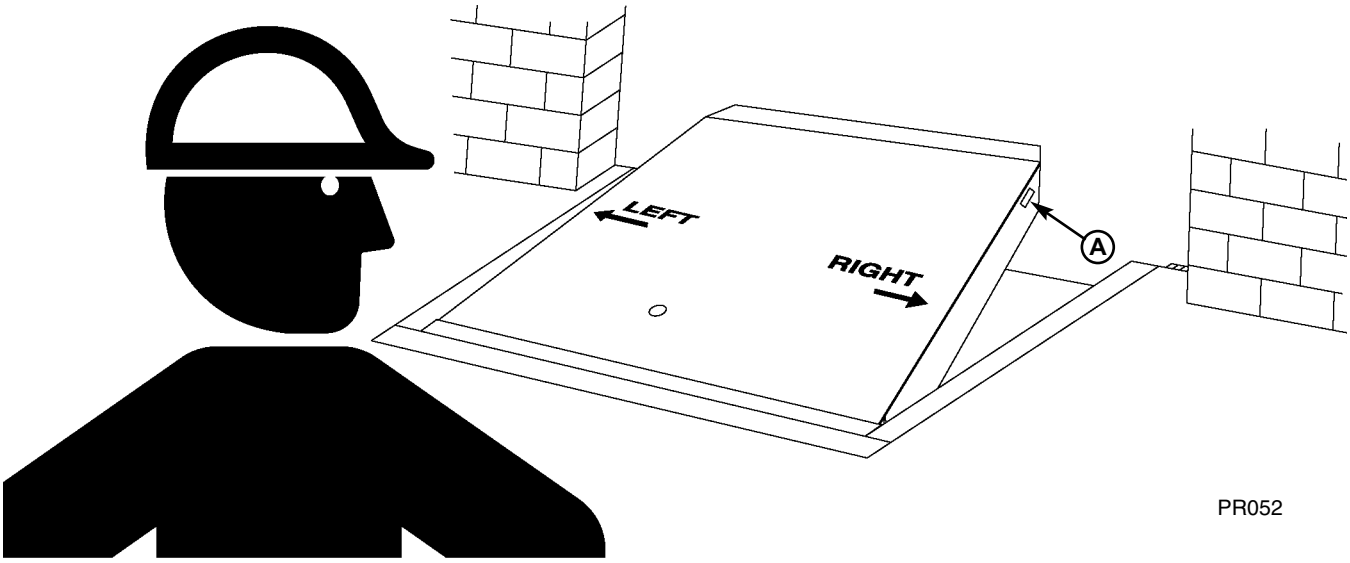
Item	Quantity	Part Number	Description
A	1	1751-0033	SIGN,PULL IN/OUT ON GREEN ONLY RIGHT READING,16-7/8x8x3/32
B	1	1751-0034	SIGN,PULL IN/OUT ON GREEN ONLY MIRROR IMAGE,16-7/8x8x3/32

OSLA (Outside Light Assembly)



Item	Quantity	Part Number	Description
1	1	3055-0008	Complete Light Housing, Yellow Plastic, LED Lights
	1	3055-0002	Complete Light Housing, Yellow Plastic, Incandescent Lights
	1	3055-0009	Complete Light Housing, Clear Charcoal, LED Lights, Strobe
	1	3055-0007	Complete Light Housing, Clear Charcoal, Incandescent Lights, Strobe
	1	3051-0063	Light Housing Only, Yellow Plastic
	1	3051-0100	Light Housing Only, Clear Charcoal
2	1	3051-0102	Lens/Housing/Circuit Assembly Red-LED
3	1	3051-0103	Lens/Housing/Circuit Assembly Green-LED
*	2	3051-0085	Lamp, 25W,120V,Incandescent, BAY (Rated 1000 Hours)
*	2	3051-0066	Socket Harness for Incandescent Lamp
2	1	3051-0064	Lens, Red
3	1	3051-0065	Lens, Green
4	1	3051-0068	Mounting Gasket
5	4	3051-0105	Clips, Lens Holding
6	4	3051-0104	Screw, Lens Holding Clip
7	1	x	Conduit Fastener, 3/4” x 3/8” (Included in Light Package)

Customer Information



NOTE: Refer to illustration for left/right orientation of dock leveler.

The model/serial number decal (A) is located on the right platform joist near the front (lip) of dock leveler.

When you receive your PR dock leveler, write down the dock leveler model and serial number in the form provided. This will help ensure safe keeping of the numbers in the event the model/serial number decal (A) becomes lost or damaged.

Also, write down Systems, Inc.'s job number, the company that installed the dock leveler, and the original owner's name. This will all help to identify the specific dock leveler if more information is required.

When ordering, use part numbers and description to help identify the item ordered. Do not use "item" numbers. These are only for locating the position of the parts. Always give dock leveler MODEL NUMBER and/or SERIAL NUMBER.

For service, call or contact:

Systems, Inc.
P.O. Box 309
Germantown, WI 53022

Phone: (800) 643-5424
Fax: (262) 255-5917

Dock Leveler Information

Model _____

Serial No. _____

Systems, Inc., Job No. _____

Original Owner Information

Name _____

Address _____

_____

Installer Information

Name _____

Address _____

_____

Date of Installation _____

STANDARD PRODUCT WARRANTY

SYSTEMS, INC. warrants that its products will be free from defects in design, materials and workmanship for a period of one (1) year from the date of shipment. All claims for breach of this warranty must be made within 30 days after the defect is or can with reasonable care, be detected. In no event shall any claim be made more than 30 days after this warranty has expired. In order to be entitled to the benefits of this warranty, the product must have been properly installed, maintained and operated in accordance with all manufacturer's recommendations and/or specified design parameters and not otherwise have been subject to abuse, misuse, misapplication, acts of nature, overloading, unauthorized repair or modification, application in a corrosive environment or lack of maintenance. Periodic lubrication, adjustment and inspection in accordance with all manufacturers' recommendations are the sole responsibility of the Owner/User.

In the event of a defect, as determined by SYSTEMS INC., covered by this warranty, SYSTEMS INC. shall remedy such defect by repairing or replacing any defective equipment or parts, bearing the cost for the parts, labor and transportation. This shall be exclusive remedy for all claims whether based on contract, negligence or strict liability.

WARRANTY LIMITATIONS

THE ABOVE WARRANTIES ARE IN LIEU OF ANY OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SYSTEMS INC. AND ITS SUBSIDIARIES SHALL NOT IN ANY EVENT BE LIABLE TO ANYONE, INCLUDING THIRD PARTIES, FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND INCLUDING BUT NOT LIMITED TO, BREACH OF WARRANTY, LOSS OF USE, LOSS OF PROFIT, INTERRUPTION OF BUSINESS OR LOSS OF GOODWILL.

PRODUCT SPECIFIC WARRANTY
"PowerHold®" SERIES VEHICLE RESTRAINT

In addition to the "Standard Product Warranty" provided with all Poweramp® Products, Systems Inc., guarantees materials, components and workmanship to be free of defects for the following extended periods:

- Structural Warranty – For a period of five (5) years from the date of shipment, this warranty specifically applies to; restraint shoe, pivot pin and frame weldment only.
- Hydraulic Warranty – For a period of two (2) years from date of shipment, this warranty specifically applies to; the hydraulic pump and motor, all hydraulic cylinders, hydraulic pressure lines, fittings and valves only.
- Electrical Warranty – For a period of two (2) years from date of shipment, this warranty specifically applies to; the control box components, proximity switches, coils and proximity sensor when interlocked with a Poweramp® leveler only.